DRANETZ

626 - RMUs / 626 - PA - 6036

SV. Vol. 2

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WARNING

Because of possible shock or fire hazards, connection of this instrument should be performed in compliance with the National Electric Code (ANSI C1) or any other requirements, or both, which may be applicable to the user.

Installation, operation, and maintenance should only be performed by qualified personnel.

TM-111200

VOLUME 2 -- SERVICE MANUAL

REMOTE MONITOR UNITS: 626-RMU-1, -626-RMU-3, 626-RMU-3A

626-RMU-3H, 626-RMU-3AH

AND

REMOTE MONITOR INTERFACE ADAPTER: 626-PA-6036

1 September 1985
(Rev. 15 April 1987)

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Note: Refer to Volume 1 (Operator's Manual) of TM-111200 and TM-111236 for the installation and operation instructions.

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VOLUME 2
SERVICE MANUAL

REMOTE MONITOR UNITS AND INTERFACE ADAPTER PLUG-IN

SECTION IV
THEORY OF OPERATION

4.1 SCOPE

Volume 2 of TM-111200 provides the service, calibration, and maintenance instructions for five models of the Remote Monitor Unit and the 626-PA-6036 Interface Adapter plug-in. It is divided into four sections: (IV) THEORY OF OPERATION, (V) MAINTENANCE AND CALIBRATION, (VI) REPLACEABLE PARTS LIST, and (VII) SCHEMATICS AND ASSEMBLY DRAWINGS. See Volume 1 of TM-111200 and TM-111236 for the installation and operation instructions.

4.2 INTRODUCTION

The five Remote Monitor Unit models are the 626-RMU-1, -3, -3A, -3H, and -3AH. The five models are similar; for simplicity, the terms "Remote Monitor" and "RMU" will be used when referring to common features or operations. (See figure 7-1 for the RMU main assembly drawing.) The 626-PA-6036 Remote Monitor Interface Adapter plug-in requires no maintenance or calibration, and is referred to as the "6036 plug-in". The 6036 plug-in's assembly drawings and schematic diagram are shown in Section VII, figures 7-5, 7-6 and 7-11.

4.3 GENERAL FUNCTIONAL DESCRIPTION

The RMU consists of four major sections, each of which is described below:

Analog. The analog section contains input attenuators, filters, and peak detectors, resulting in signal voltages which correspond to the AC level, high frequency impulses, etc.

Digital. The digital section contains a microprocessor which reads the appropriate voltages, once per input cycle, using an analog-to-digital converter, and determines if any disturbances have occurred. The digital section also contains a communications interface, cartridge interface, and LED display circuits. See figure 7-10 for the LED indicator board schematic.

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Clock\memory. The clock/memory section stores all of the event, threshold, and time data. It contains a battery backup which is activated if the RMU's power is cut off.

Power Supply. The power supply provides the necessary operating voltage for the digital, analog, and logic circuits. It is designed to function over a wide input voltage range.

4.3.1 RMU Circuits

The RMU circuits are located on three PC boards: analog, digital, and LED display boards. (See figure 7-7 for the interconnecting wiring diagram.) The analog board contains the front-end circuitry and most of the analog circuits, as well as the entire clock/memory section and some power supply components. The digital board contains most of the digital section, plus some of the analog circuits. The LED display is located on its own board behind the front panel. The fuse, switches, interface connectors, and power supply transformer are all mounted to the rear panel.

4.4 ANALOG BOARD, DETAILED CIRCUIT DESCRIPTION

The analog board's block diagram is shown in figure 4-1.

4.4.1 Power Supply

The power supply is basically a conventional linear design. (See fig. 7-8.) The power line is filtered (L1, L2, C71, etc.) prior to being applied to transformer T1. Fuse F1 provides short-circuit protection. S1 is the ON/OFF switch; S2 connects the primary windings of T1 in parallel for 115V nominal line voltage, and in series for 230V operation. A separate pole is used to send a logic high to the digital board whenever the unit is turned off.

One of the secondary windings (pins 8 and 9) is full-wave rectified and fed to a positive 5V regulator U22. The center-tapped secondary winding is full-wave rectified and then fed to adjustable positive and negative regulators U21 and U20, respectively.

Ptentiometer R64 is adjusted for U21 to supply +15 volts, and R63 is adjusted so that U20 supplies -15 volts. The unregulated input voltage for U2 is sent (via pin 3 of P2) to the digital board for power loss detection. The supply will provide up to 500 milliamps at +5V, and 250 milliamps at +15V and -15V, for a total of 10 watts.

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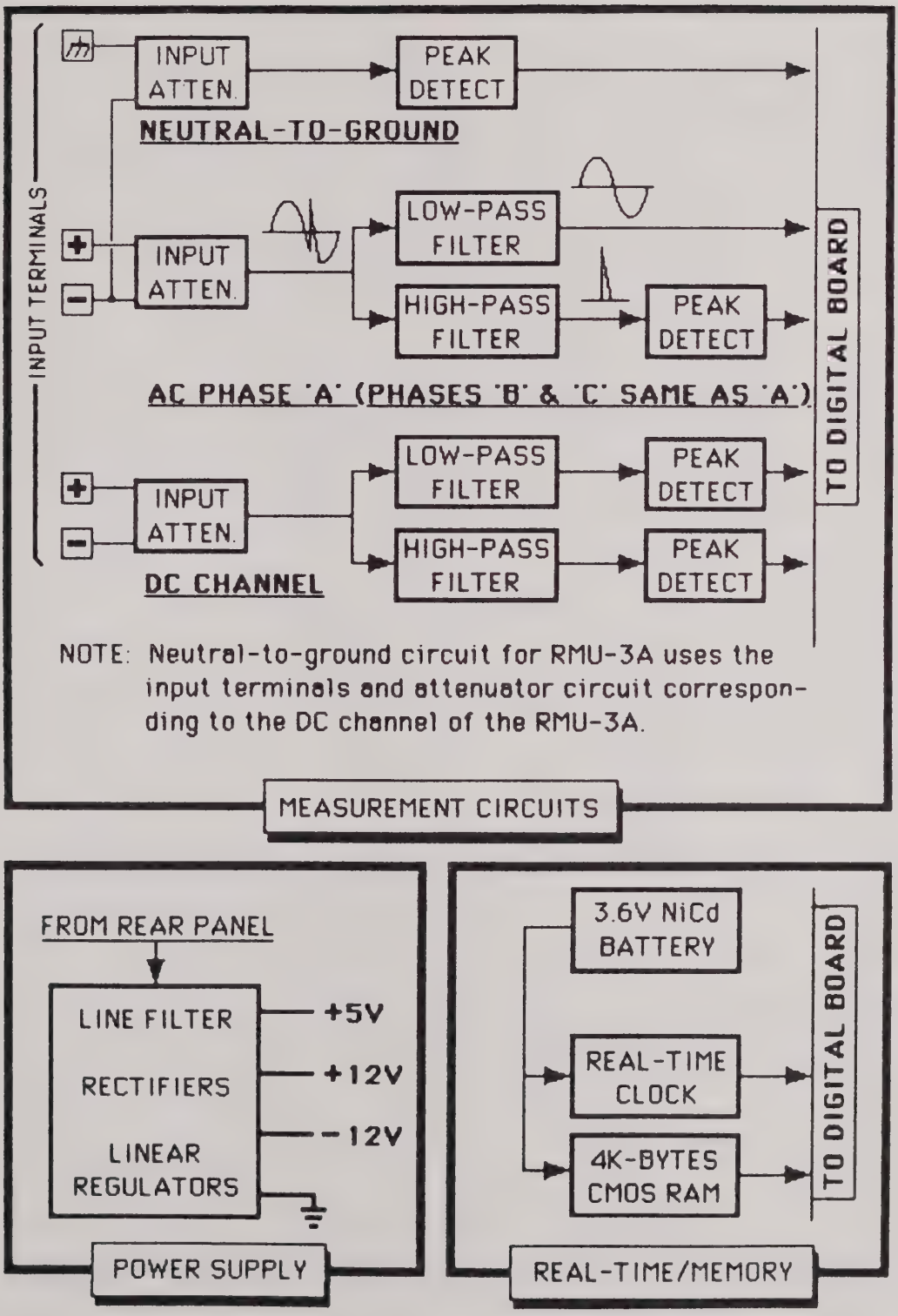

Figure 4-1. 626-RMU Analog Board, Block Diagram

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4.4.2 Analog Circuits

NOTE

Descriptions concerning phase "A" apply to single-phase units. Descriptions pertaining to phases A, B, and C apply to 3-phase units.

Figure 7-8 (the analog board schematic) indicates where op-amp pinouts differ from those in phase A. In the 626-RMU-1, the voltage at the power cord receptacle is internally connected to the phase A front end circuitry. Throughout the following description, IC pin numbers that appear in brackets indicate where the important signals appear. For the analog board part locations, refer to figure 7-2.

4.4.2.1 AC Line Voltage

The measured AC line voltage is attenuated (U11, pin 1) and passed through a 4-pole, low-pass filter (U7A, pin 7). It is then sent to the digital board (via pin 10 of P2) for further processing. C5A removes any DC offset introduced by the circuitry. Potentiometer R23A is adjusted to null out the 60 Hz common mode response. R15A is the AC level calibration trimmer.

4.4.2.2 Impulse Measurement

For impulse measurements, both sides of the input are attenuated by capacitive voltage dividers and fed to a high frequency differential buffer (U10, pin 7). Resistors R21A and R22A give the buffer a single pole high-pass characteristic. The buffer is followed by a 2-pole, high pass section, resulting in a 3-pole filter (U9AB, pin 1).

The filtered signal passes through a high-speed, full-wave rectifying peak detector (U2AB, pin 1), then to a low-droop peak detector (U1A, pin 1), and finally up to the digital board. C22A is adjusted to null out any common mode impulse response. R5A is the impulse calibration trimmer.

4.4.2.3 626-RMU-1, -3 and -3H Neutral-to-Ground Voltage

For the 626-RMU-1, -3, and -3H, the neutral-to-ground voltage is attenuated by an all-pass divider (U10, pin 1), then sent to a full-wave rectifying peak detector, and finally up to the digital board. R74 is adjusted to match a 60 Hz response with a high frequency response. R71 is the neutral-to-ground calibration trimmer.

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4.4.2.4 626-RMU-3A and -3AH Neutral-to-Ground Voltage

For the 626-RMU-3A and -3AH, differential inputs are provided for neutral-to-ground monitoring. The measured voltage is attenuated by an all-pass differential amplifier (U13, pin 7), and then fed to U10, pin 3. (At this point, the circuit is identical to the 626-RMU-1, -3, and -3H.) Again, R71 is the neutral-to-ground calibration trimmer.

4.4.2.5 626-RMU-3 and -3H DC Input

The DC input of the 626-RMU-3 and -3H is attenuated by an all-pass differential amplifier (U13, pin 7). DC level is measured by low-pass filtering and half-wave rectifying the attenuated signal. The signal at the cathode of CR7 is sent to the digital board. If negative DC voltage is applied to the input of the unit, it will measure it as 0.0 volts, because of the half-wave rectifier.

Impulses in the DC channel are measured by passing the attenuated signal through a 2-pole, high-pass filter (U9CD, pin 7), on to a full-wave rectifying peak detector, and finally up to the digital board. C45 is adjusted to null out common mode impulse response. R35 is the DC level calibration trimmer. R34 is an offset trimmer.

4.4.3 Clock/Memory Section

Power to U15, U16, U18, and U19 is provided through diodes connected to the batteries and the +5V power supply. U14 is powered directly from the batteries. Battery power is supplied by three 1.2V nickel-cadmium cells connected in series. While the unit is powered, the voltage drop across R50 results in a near-constant 25 mA charging current. When fully charged, battery voltage is typically 4 volts. J1 may be set to disconnect the batteries during assembly, repair, or long-term storage.

4.4.3.1 Microprocessor Reset Circuit

While the unit is off, or if the +5V power supply drops, the output of the comparator (U13, pin 16) is high, thus disabling tri-state buffer U19. This prevents the clock and memory chips from being accessed, and ensures the lowest possible power consumption. The microprocessor reset line is pulled low during this time by a pull-down resistor on the digital board. This prevents the microprocessor from trying to run with a low power supply voltage. Upon "power-up", there is a slight delay before the tri-state buffer is enabled. This allows the power supply to stabilize before releasing the reset line.

4.4.3.2 Microprocessor Memory Access

During every microprocessor memory access cycle, U17 latches the low order address byte from the multiplexed address/data bus. U16 appears to the microprocessor as a 2K-byte block of RAM memory. U15 is also a 2K-byte RAM IC, but is decoded in such a way that only 128 bytes of address space are used to access it.

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The microprocessor selects one of 16 banks of 128 bytes by writing the proper data to latch U7 on the digital board. The time clock IC, U14 (which also contains 50 bytes of RAM) is programmed to interrupt the microprocessor once per second as the time is updated. Time updates continue while the unit is off. C52 is the time clock oscillator calibration timer.

4.5 DIGITAL BOARD, DETAILED CIRCUIT DESCRIPTION

A block diagram of the digital board appears in figure 4-2; the schematic diagram of this board is shown in figure 7-9.

4.5.1 Analog Circuits

The low-pass filtered AC signals are full-wave rectified, peak detected (U32, pin 6), and sent to the analog switches. For phase A, the filtered signal is used to determine zero crossings using a comparator (U17, pin 2). The rectified DC level and the neutral-to-ground peak detector on the analog board are connected to a low-droop peak detector, and from there to an analog switch. The AC impulse peak detectors are followed by track-and-hold amplifiers before connection to the analog switches.

Altogether, there are nine switches which form an analog multiplexer corresponding to AC levels, AC impulses, neutral-to-ground, DC level, and DC impulse. Note: Only three of these switches are used for the 626-RMU-1. The microprocessor selects these inputs one at a time for analog-to-digital conversion by writing the appropriate data to latches U7 and U8.

The unregulated power supply voltage from the analog board is then fed to a comparator. R37 is adjusted so the comparator will output a logic high whenever less than 90 volts are applied to the RMU's power supply. When power to the RMU is lost or turned off, the $\pm$15V power supplies go down before the +5V power supply. Diodes CR10 and CR11 ensure that the comparator has enough power to signal a power loss before the logic supply is lost. This permits an orderly software shutdown.

4.5.2 Digital Hardware

The microprocessor IC, U1 (a 6805), provides two 8-bit I/O ports, some internal RAM, and an internal timer. The low-order byte of the address bus is multiplexed with the data bus, so U16 is used to latch the low order address byte during each memory access cycle. The lower half of the 8K-byte address range is used for the RAM, time clock, I/O, control latches, and a status port. The upper half is used for software in the PROM.

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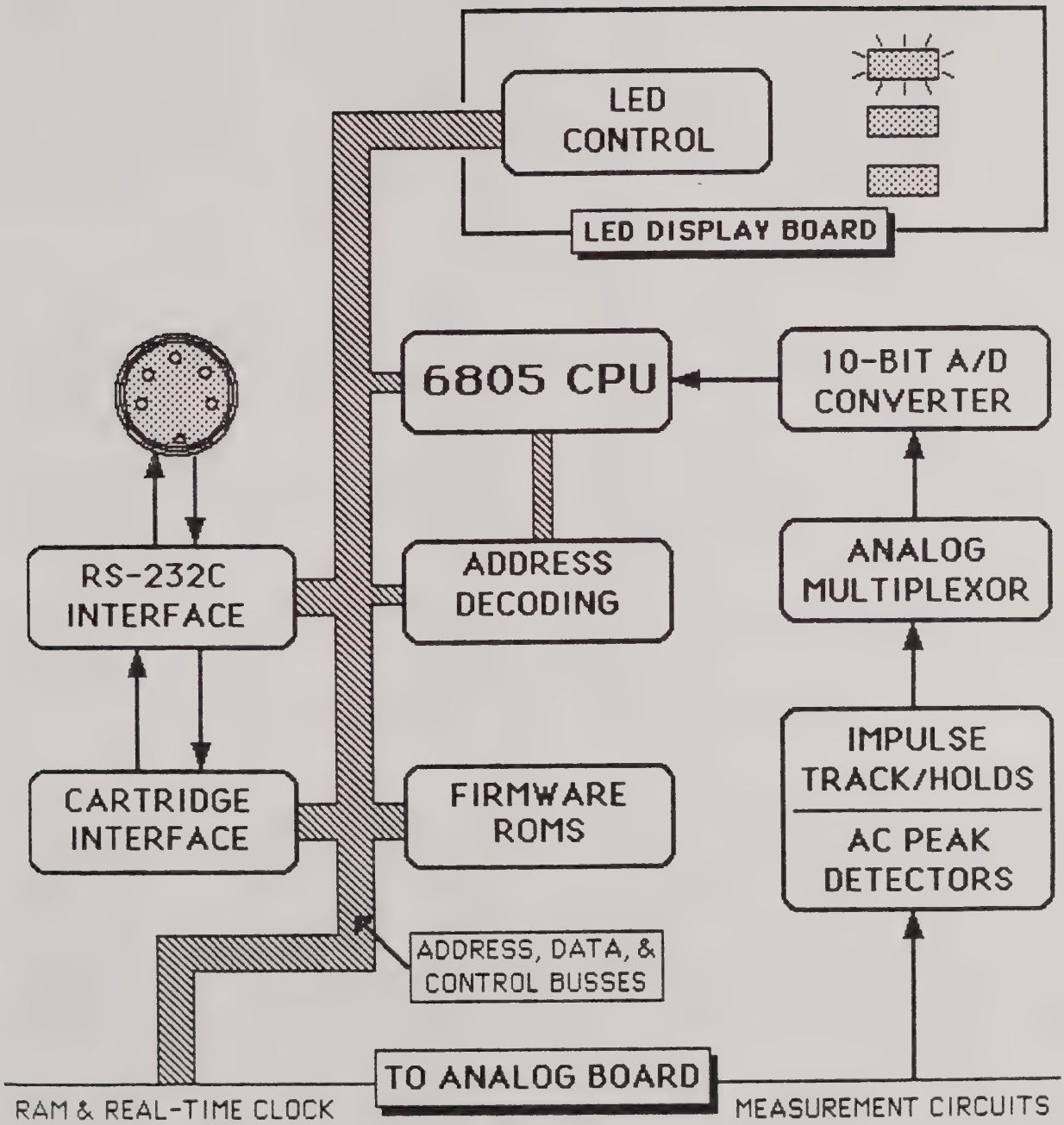

Figure 4-2. 626-RMU Digital Board and LED Display, Block Diagram

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If just one PROM were used, only 4K bytes of program would be possible. To expand the amount of program space, any of three PROMs may be selected by the microprocessor to reside in the same 4K byte area. The 6805 powers up with its I/O ports configured as high impedance inputs, allowing R8 to pull bit 7 of port A high (U1, pin 7), thus forcing the program to start from the PROM at U2. The software configures the I/O ports in such a way that by setting bit 7 of port A low, the 6805 can execute programs from PROMs at either U3 or the cartridge, depending on the state of the control latch outputs (U33, pins 2 and 19). Port B and four lines of port A are used to read and control the 10-bit A/D converter, U4.

4.5.2.1 6805 Interrupts

During normal operation, the 6805 may be interrupted from any one of five sources. A high level on one of the data inputs of the priority encoder, U5, will drive the interrupt request line (IRQ) low (U1, pin 2), and generate a priority code. This priority code is then read by the 6805 using three of port A's I/O lines.

If more than one source tries to interrupt the 6805, it (or they) will be recognized in descending order of importance. Highest priority is given to the ON/OFF switch and the power loss detector in order to allow the 6805 to shut down properly before the logic supply becomes too low.

Other sources of interrupts are the communications port, real time clock, and zero crossings of the input to phase A. The priority encoder may be disabled by writing the proper data to latch U7 so that pin 5 of U5 is brought low. In addition to external interrupts, the internal timer is set to interrupt the 6805 at 10-millisecond intervals.

4.5.3 Communication

AN ACIA (Asynchronous Communications Interface Adapter) is used to perform parallel-to-serial and serial-to-parallel conversions. The baud rate is software programmable, and is usually kept at 9600. If a modem cartridge is present, 300 baud will be used during telephone communications. Serial input data may be received either from the communications port on the rear panel, or from the modem cartridge, depending on the state of U7, pin 5. Serial output data will be transmitted to both locations. The logic levels at the port are RS-232 compatible.

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4.5.4 Measurement Cycle

The track-hold amplifiers that follow the AC impulse peak detectors are normally tracking (pin 6 of U30, U29, and U22). When a negative-going zero crossing occurs on phase A, pin 2 of U17 will go high, causing the output of a latch to go high (U15, pin 9). This, in turn, clocks another latch high (U15, pin 5). This signal causes the analog switches of the track-hold amplifiers to open (pin 16 of U18, U19, and U20), starts a one-shot to reset the AC impulse peak detectors (U16, pin 13), and interrupts the 6805 with a priority code 3. The 6805 will then use the A/D converter to read nine voltages, selecting one at a time by enabling one of the analog switches. After all have been read, the 6805 writes to a location which pauses pin 1 of U15 to go low, This starts a one-shot to reset the remaining peak detectors, allows the track-hold amplifiers to track, and removes the interrupt.

The 6805 then resets the first latch (U15, pin 13), and the cycle begins again. If no zero crossing occurs on phase A after 20 milliseconds, the 6805 will manually trigger the hardware and continue to take readings at 10-millisecond intervals.

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SECTION V
MAINTENANCE AND CALIBRATION

5.1 GENERAL

This section provides the maintenance and calibration instructions for the 626-RMU-1, -3, -3A, -3H and -3AH. (The 6036 plug-in does not require maintenance or calibration.)

5.1.1 Maintenance

The only required maintenance for your RMU is its calibration, which should be done every 12 months. You may return the RMU to the factory for calibration (contact the Dranetz Service Corporation for instructions: Tel No. 201-755-7081, TWX: 710-997-9553, Telex: 499-7808, Cable: DRANETZ, or you may calibrate the RMU on your own with proper equipment by following the CALIBRATION PROCEDURE.

5.1.2 Service Warnings

WARNING

The following calibration instructions are intended for qualified personnel ONLY. To avoid electrical shock, DO NOT perform any service other than that contained in your Operator's manual unless you are qualified to do so.

DO NOT attempt internal service or adjustment unless another person, capable of rendering aid and resuscitation, is present.

Read Instructions Carefully

Because of possible shock or fire hazard, DO NOT perform any service tasks which are beyond your qualifications. Your qualifications for performing such tasks should be self-determined.

5.2 CALIBRATION PROCEDURE

CAUTION

To prevent damage to the RMU while soldering, inserting, or removing components, set J1 on the analog board so that the shorting bar is between pins 2 and 3. Remember, however, to move the shorting bar back between pins 1 and 2 before operating the RMU.

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5.2.1 Recommended Equipment

1) CRT data terminal and keyboard: Zenith Z-19,

2) Disturbance simulator: Dranetz 604A,

3) Digital multimeter: Fluke 8800A,

4) Peak-reading voltmeter: Micro Instrument 5203,

5) Variable autotransformer: Variac W8MT3,

6) Oscilloscope, 25 MHz or better, 10 megohm probes,

7) Source of DC voltage,

8) Interface cable: Dranetz P/N 111346-G1, and

9) Test Software PROMS (contact the Dranetz Service Corporation for this information).

5.2.2 Initial Setup

626-RMU-1 (ONLY)

The 626-RMU-1 has black and white wires connecting the phase A input section to the RMU's power cord receptacle.

(1) Unsolder the wires from the PC board at the input section.

WARNING

Tape the unsoldered wires to avoid dangerous voltage.

(2) Install two temporary black and white wires so that test signals may be applied to the phase A input.

626-RMU-3, -3A, -3H, and -3AH (ONLY)

(1) For your 3-phase unit (626-RMU-3, -3A, -3H, and -3AH), wire the barrier block so that signals may be applied simultaneously to phases A, B, and C.

(2) Set all trimmers to the center of rotation.

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626-RMU-1, -3, -3A, -3H, and -3AH

(Unless stated otherwise in the following procedures, all adjustments are made on the analog board.) Proceed with the following procedure for all five units when installing and using the RMU TESTPROMS.

(1) Remove the PROMS at U2 and U3 on the RMU digital board and install the TESTPROMS in their place (320-volt version for 626-RMU-1, -3, and -3A, and 600-volt version for 626-RMU-3H and -3AH).

(2) Set the Data Terminal for 9600 baud.

(3) Connect the interface cable from the RMU to the Terminal.

(4) Turn on the Terminal.

(5) Turn on the RMU.

The LED display should cycle as usual, and after a few seconds, the UNIT ACTIVE LED may or may not light, depending on the condition of the diagnostic error code. Depressing "@" followed by a carriage return at the terminal will display the unit identifier message, followed by the MAIN MENU list. The MAIN MENU prompts are similar to the prompts when using the U3 PROM with the following exceptions---the MAIN MENU shows only eight options instead of nine. Option "9 PRESENT VOLTAGE" is eliminated. In its place are three hidden (no prompts displayed) options: "C", "K", and "U". Note that these prompts are available only from the MAIN MENU.

Depressing "C" will display the AC levels and impulses for three phases, neutral-to-ground voltage, DC level, and DC impulses. These voltage levels will be continuously updating. In order to freeze the display, depress "CTRL S". To resume display updating, depress "CTRL Q". To abort the option, depress "CTRL C".

Depressing "K" will erase the unit's historical data.

Depressing "U" will display the current time and date and will update the time on the screen every second. To abort the option, depress any key.

5.2.3 Power Supply Voltage

(1) Set R64 so that the voltage at pin 8 of U1A is +15.0V DC.

(2) Set R63 so that the voltage at pin 4 of U1A is -15.0V DC.

5.2.4 Common Mode, AC

(1) Apply 120V AC to the "+" and "-" terminals of all AC inputs.

(2) Adjust R23A so that the signal at pin 1 of U11 is at a minimum: less than 50 millivolts P-P (peak to peak).

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626-RMU-3, -3A, -3H, and -3AH (ONLY)

(1) For your 3-phase unit, adjust R23B and R23C to minimize the signals at U11, pin 7; and U13, pin 1 (respectively).

5.2.5 Common Mode, Impulse

(1) Set up the impulse generator to apply 200V, 1/2-sinewave, 10 uSec impulses to both the "+" and "-" terminals of all AC inputs.

(2) Adjust C22A so that the signal at pin 7 of U10 is at a minimum (less than a 25 millivolt peak).

626-RMU-3, -3A, -3H, and -3AH (ONLY)

(1) For your 3-phase unit, adjust C22B and C22C to minimize the signals at U12, pin 1; and U12, pin 7 (respectively).

626-RMU-3 and -3H (ONLY)

(1) For the 626-RMU-3 and -3H, set up the impulse generator to apply 25V (for the -3) or 75V (for the -3H), 1/2-sinewave, 30 uSec impulses to both the "+" and "-" terminals of the DC channel.

(2) Adjust C45 so that the signal at pin 7 of U13 is at a minimum (less than 50 millivolts).

5.2.6 AC Level

(1) Apply 119.5V AC between the "+" and "-" terminals of all AC inputs.

(2) Depress "C" at the terminal to display current input voltages.

(3) Adjust R15A so that phase A reads 119 volts, then slowly rotate R15A until the voltage just begins to read between 119 and 120.

626-RMU-3, -3A, -3H, AND -3AH (ONLY)

(1) For your 3-phase unit, adjust R15B and R15C for similar results on phases B and C, respectively.

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5.2.7 626-RMU-1, -3, and -3H Neutral-to-Ground

(1) Set up the impulse generator to apply 150V, 1/2-sinewave, 10 uSec impulses between the "-" terminal of phase A and the case ground.

(2) Adjust R71 so that the largest "NEUT" reading obtained for repeated impulses is 150 volts.

(3) Disconnect the impulse generator and apply 106V AC between the "-" terminal of phase A and the case ground.

(4) Adjust R74 so that the "NEUT" reading is 150 volts.

5.2.8 626-RMU-3A and -3AH Neutral-to-Ground

(1) Set up an impulse generator to apply 150V 1/2-sinewave, 10 uSec impulses between the "+" and "-" inputs of the "NEUT" channel.

(2) Adjust R71 so that the largest "NEUT" reading obtained for repeated impulses is 150 volts.

5.2.9 Impulse

(1) Set up the impulse generator to apply 10 uSec, 1/2-sinewave impulses between the "+" and "-" terminals of all AC inputs. The peak amplitude should be as high as possible (up to 1000 volts -- or up to 2000 volts for the "H" versions).

(2) Adjust R5A so that the phase A impulse reading is correct. For the 3-phase unit, adjust R5B and R5C for similar results on phases B and C, respectively.

5.2.10 DC Level and Impulse for the 626-RMU-3 and -3H

(1) Connect a lead from case ground to the "-" terminal of the DC channel.

(2) Connect a lead from U1A, pin 8 (+15 volt supply) to the "+" terminal of the DC channel.

(3) Adjust R35 so that the DC average reading is 15.0 volts.

(4) Set up the impulse generator to apply 25V (for -3) or 50V (for -3H), 1/2 sinewave, 30 uSec impulses between the "+" and "-" terminals of the DC channel.

(5) Adjust R36D on the digital board so that the DC impulse reading is correct.

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5.2.11 Power Loss Trip Point

(1) From the 626-RMU-1, remove the temporary black and white leads from the phase A inputs, and reconnect the regular black and white wires from the power cord receptacle to the phase A inputs.

(2) Using a variable transformer, apply 89V AC to power the unit.

(3) On the digital board, rotate R37 fully clockwise, then slowly counterclockwise, until the logic level on pin 10 of U17 switches from low to high.

5.2.12 Time Clock Oscillator Frequency

(1) Using a frequency counter, adjust C52 so that the period of the signal at pin 21 of U14 is 30.51758 microseconds, corresponding to a frequency of 32.768 kHz.

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SECTION VI
REPLACEABLE PARTS LIST

6.1 GENERAL

The replaceable parts list identifies the replaceable parts in the Remote Monitor Unit and the 626-PA-6036 plug-in. For each replaceable part, the following is presented: reference designation (if applicable), part number, manufacturer's code number, and description. Hardware is not included in this table. For information concerning the hardware, contact the Dranetz Service Corporation.

Refer to figures 7-1 through 7-6 for the location of the replaceable parts referenced in the parts list.

6.2 MANUFACTURER'S CODES

The manufacturers' codes referenced in the Replaceable Parts List that follows are identified below.

Man. Code	Source
00779	Amp, Inc., P.O. Box 3608 Harrisburg, PA 17105
23207	Dranetz Technologies, Inc. 1000 New Durham Road, P.O. Box 4019 Edison, New Jersey 08818-4019 (201) 287-3680
81349	On Mil specification list. Manufactured to meet military specifications. Available from a variety of suppliers.
MILTON ROSS	Milton Ross Co. 1770 Walt Whitman Rd. Melville, N.Y. 11747
SAMTEC	Samtec Inc. 810 Progress Blvd P.O. Box 1147 New Albany, IN 47150

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

RMU Mainframe (G1-G5 Versions), P/N 111200-G[ ]

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
A1	111222-G1*	23207	LED PCB Assy
	111222-G2**	23207	LED PCB Assy
	111222-G3***	23207	LED PCB Assy
A2	111210-G1*	23207	Digital PCB Assy
	111210-G2+	23207	Digital PCB Assy
A3	111216-G1*	23207	Analog PCB Assy
	111216-G2++	23207	Analog PCB Assy
	111216-G3+++	23207	Analog PCB Assy
	111216-G4*+	23207	Analog PCB Assy
	111216-G5*++	23207	Analog PCB Assy
A4	111209-G1	23207	Audio Cable Assy
A5	111346-G1	23207	Interface Cable Assy
L1,L2	104619	23207	Ferrite Bead
F1	103282-G9	23207	Fuse, Slo-Blo, 3/16A, 250V

---

*Used in -G1 version (of RMU) only
**Used in -G2 and -G4 versions only
***Used in -G3 and -G5 versions only
+Used in -G2 thru -G5 versions only
++Used in -G2 version only
+++Used in -G3 version only
*+Used in -G4 version only
*++Used in -G5 version only

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

RMU Mainframe (G1-G5 Versions), P/N 111200-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
	107522-G1	23207	Fuseholder
	107523-G1	23207	Fuse Carrier
J1	104907	23207	AC Connector
	104943	23207	AC Power Cord
S1	104862	23207	3PDT Rocker Switch
S2	104804	23207	DPDT Slide Switch
T1	104660	23207	Transformer
TB1	103253-G9	23207	Barrier Block, Rt Angle

Analog Board (G1-G5 Versions), LM 111216-G[ ]

BT1,BT2,BT3	110784	23207	Battery, NiCad, 1.2V, 0.5AH/0.6AH
C1A,C1B*,C1C*, C4A,C4B*,C4C* C6A,C6B,C6C*, C7A,C7B*,C7C*, C12A,C12B,C12C*, C13A,C13B,C13C*, C15A,C15B,C15C*, C16A,C16B*,C16C*, C23A,C23B,C23C*, C24A,C24B*,C24C*, C33*,C35*,C36*,C38*, C43*,C48,C49,C50, C51,C54,C56,C60, C61,C66,C67,C68	103209-G3	23207	Cap, 0.47 uf, 20%, 50V

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*Used in -G2 thru -G5 versions of RMUs only

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

Analog Board (G1-G5 Versions), P/N 111216-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
C2A,C2B*,C2C*, C9A,C9B*,C9C*, C39*	104087-G3	23207	Cap, .022 uf, 10%, 63V
C3A,C3B*,C3C*, C32*	104015-G2	23207	Cap, 220 pf, 5%, 500V
C5A,C5B*,C5C*	104067-G8	23207	Cap, 2.2 uf, 10%, 25V
C8A,C8B*,C8C* C19A,C19B*, C19C*,C20A, C20B*,C20C*, C40*,C41*	104087-G1	23207	Cap, .01 uf, 10%, 63V
C11A,C11B*, C11C*,C34*	104022-G3	23207	Cap, 56 pf, 5%, 500V
C14A,C14B*, C14C*,C37*	104018-G5	23207	Cap, 150 pf, 5%, 500V
C17A,C17B*, C17C*	104088-G1	23207	Cap, 1500 pf, 10%, 100V
C18A,C18B*, C18C*	104087-G2	23207	Cap, .015 uf, 10%, 63V
C21A,C21B*, C21C*,C26A, C26B*,C26C*, C27A,C27B*, C27C*	104022-G4	23207	Cap, 200 pf, 5%, 500V
C22A,C22B*, C22C*,C45,C52	104109-G3	23207	Cap, Var, 6.5-30.0 pf, 100V
C25,C25B*,C25C*	104022-G5	23207	Cap, 180 pf, 5%, 500V

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*Used in -G2 thru -G5 versions only.

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

Analog Board (G1-G5 Versions), P/N 111216-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
(C28A,C29A), (C28B,C29B)*, (C28C,C29C)*	104089	23207	Matched Pair, Cap, .022 uf, 63V
(C30A,C31A)** (C30B,C31B)** (C30C,C31C)**	104115	23207	Matched Pair, Cap, Cap, 50 pf, 5KV
C42+,C44+	104023-G8	23207	Cap, 300 pf, 2%, 500V
C42++,C44++	104021-G2	23207	Cap, 1200 pf, 2%, 500V
(C42,C44)+++	104090	23207	Matched Pair, 1000 pf Nom, Matched to 1/2%
C46++	104023-G1	23207	Cap, 100 pf, 1%, 500V
(C46,C47)+++	104091	23207	Matched Pair, 43 pf Nom, Matched to 1/2%
C47*+	104111-G3	23207	Cap, 75 pf, 2%, 500V
C53	104016-G1	23207	Cap, 15 pf, 5%, 500V
C55	103209-G2	23207	Cap, 0.22 uf, 20%, 50V
C57,C58,C59	104080-G1	23207	Cap, 47 uf, 20%, 50V
C62,C69***	104021-G6	23207	Cap, 1000 pf, 2%, 100V
C63,C64	104082-G2	23207	Cap, Elec, 1000 uf, -10%/+50%, 50V
C65	104082-G3	23207	Cap, 4700 uf, -10%/+50%, 25V
C70***	104111-G5	23207	Cap, 43 pf, 2%, 500V

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*Used in -G2 thru -G5 versions only.
+Used in -G2 version only.
++Used in -G4 version only.
+++Used in -G3 and -G5 versions only.
*+Used in -G2 and -G4 versions only.
**Used in -G4 and -G5 versions only.
***Used in -G1, -G2, and -G4 versions only.

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

Analog Board (G1-G5 Versions), P/N 111216-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
C71-C74	104095-G1	23207	Cap, .01 uf, 20%, 125VAC
CR1A,CR1B*, CR1C*,CR2A, CR2B*,CR2C*, CR3A,CR3B,CR3C*, CR4A,CR4B*,CR4C*, CR5A,CR5B*,CR5C*, CR6A,CR6B,CR6C*, CR7*,CR8*,CR9*, CR10*,CR11*,CR27, CR30	104412-G2	23207	Diode, Hi-Speed Switching
CR12,CR13	102899	23207	Diode, Schottky Barrier
CR14,CR15, CR28,CR29	101345	23207	Diode, Low Leakage
CR16-CR26	104405-G1	23207	Diode, Gen Purp Rect, Silicon
J1	87348-3	00779	Post Header, 3 Pos.
Used at J1	2-530153-2	00779	Shunt, 2 Pos.
L1,L2	104636-G1	23207	Inductor, 1.0 mH
P1,P2	2-86945-9	00779	Flat Flex Cable Assy
Q1A,Q1B*,Q1C*, Q2A,Q2B*,Q2C* Q3*,Q4	104515	23207	Transistor, NPN Silicon
R1A,R1B*,R1C*	RCR07G822J	81349	Res, 8.2K, 5%, 1/4W
R2A,R2B*,R2C*, R6A,R6B,R6C, R30*	RCR07G107J	81349	Res, 100 Meg, 5%, 1/4W
R3A,R3B*,R3C*	RCR07G561J	81349	Res, 560 ohms, 5%, 1/4W

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*Used in -G2 thru -G5 versions only.

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RMUs AND 626-PA-6036

Analog Board (G1-G5 Versions), P/N 111216-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
R4A,R4B*,R4C*, R29*,R61	RCR07G333J	81349	Res, 33K, 5%, 1/4W
R5A,R5B*,R5C*	104700-G3	23207	Res, Var 1K, 10%, 1/2W
R7A,R7B*,R7C*	RN55C1001F	81349	Res, 1.00K, 1%, 1/10W
R8A,R8B*,R8C*	RN55C4021F	81349	Res, 4.02K, 1%, 1/10W
R9A,R9B,R9C*, R31*	RCR07G431J	81349	Res, 430 ohms, 5%, 1/4W
R10A,R10B*, R10C*,R14A, R14B,R14C*, R32*,R37*	RN55C4321F	81349	Res, 4.32K, 1%, 1/10W
R11A,R11B*, R11C*,R33*, R66	RN55C2211F	81349	Res, 2.21K, 1%,1/10W
R12A,R12B*, R12C*	RN55C2322F	81349	Res, 23.2K, 1%, 1/10W
R13A,R13B*, R13C*	RN55C1243F	81349	RES, 124K, 1%, 1/10W
R15A,R15B*, R15C*,R35*, R63,R64,R71	104719-G8	23207	Res, Var, 2K, 10%, 1/2W
R16A,R16B*, R16C*,R36*	RN55C9091F	81349	Res, 9.09, 1%, 1/10W
R17A,R17B*, R17C*,R39*	RN55C2002F	81349	Res, 20K, 1%, 1/10W
R18A,R18B*, R18C*	RN55C8872F	81349	Res, 88.7K, 1%, 1/10W

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*Used in -G2 thru -G5 versions only.

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RMUs AND 626-PA-6036

Analog Board (G1-G5 Versions), P/N 111216-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
R19A,R19B, R19C*,R40*	RN55C1213F	81349	Res, 121K, 1%, 1/10W
R20A,R20B* R20C*	RN55C3163F	81349	Res, 316K, 1%, 1/10W
R21A,R21B*, R21C*,R22A, R22B*,R22C*	RCR07G395J	81349	Res, 3.9 Meg, 5%, 1/4W
R23A,R23B, R23C*	104719-G4	23207	Res, Var, 20K, 10%, 1/2W
R24A,R24B, R24C*,R69,R70	RN55C1002F	81349	Res, 10.0K, 1%, 1/10W
R34*	104701-G3	23207	Res, Var, 200K, 10%, 1/2W
R38*	RN55C9092F	81349	RES, 90.9K, 1%, 1/10W
R41**,R42**	RN55D3324F	81349	Res, 3.32 Meg, 1%, 1/10W
R41^{+},R42^{+}	RN55C4323F	81349	Res, 432K, 1%, 1/10W
R41^{++},R42^{++}	RN55C1004F	81349	Res, 1 Meg, 1%, 1/10W
R43*$^{+}$,R44*$^{+}$	RN55D1005F	81349	RES, 10 MEG, 1%, 1/10W
R43+*,R44^{+}*	RN55C1215F	81349	Res, 12.1 Meg, 1%, 1/10W
R45,R47,R49, R51,R53	RN55D1004F	81349	Res, 1.00 Meg, 1%, 1/10W
R46,R54-R58	RN55C1003F	81349	RES, 100K, 1%, 1/10W

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*Used in -G2 thru -G5 versions only.
**Used in -G2 version only.
$^{+}$Used in -G3 version only.
$^{++}$Used in -G4 version only.
*+Used in -G2 and -G3 versions only.
+*Used in -G4 and -G5 versions only.

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RMUs AND 626-PA-6036

Analog Board (G1-G5 Versions), P/N 111216-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
R48,R60	RCR07G105J	81349	Res, 1 Meg, 5%, 1/4W
R50	RCR07G391J	81349	Res, 390 ohms, 5%, 1/4W
R52	RCR07G514J	81349	Res, 510K, 5%, 1/4W
R59	RCR07G226J	81349	Res, 22 Meg, 5%, 1/4W
R62,R65	RCR07G121J	81349	Res, 120 ohms, 5%, 1/4W
R67,R76,R77	RCR07G331J	81349	Res, 330 ohms, 5%, 1/4W
R72	RN55C4641F	81349	Res, 4.64K, 1%, 1/10W
R73*	RN55C3323F	81349	Res, 332K, 1%, 1/10W
R74*	104719-G7	23207	Res, Var, 100k, 10%, 1/2W
R75*	RN55D8874F	81349	Res, 8.87 Meg, 1%, 1/10W
(R78A,R78B, R78C,R79A, R79B,R79C)**	RN65C2005F	81349	Res 20 Meg, 1%, 1/4W
(R80A,R80B, R80C,R81A, R81B,R81C)**	RN55C2433F	81349	Res, 243K, 1%, 1/10W
RN1A***,RN1B*** RN1C+,RN2A***, RN2B***,RN2C+	104731	23207	Resistor Network
U1A,U1B++,U1C++, U7A,U7B++,U7C++,	104236-G1	23207	IC, Dual OP Amp, Low Power

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*Used in -G1, -G2, and -G4 versions only.
**Used in -G4 and -G5 versions only.
***Used in -G1, -G2 and -G3 versions only.
+Used in -G2 and -G3 versions only.
++Used in -G2 thru -G5 versions only.

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

Analog Board (G1-G5 Versions), P/N 111216-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
U2AB,U2CD++, U4AB,U4CD++, U5,U6AB,U6CD++, U8,U9AB,U9CD++, U10,U11,U12++, U13++	104236-G1	23207	IC, Dual Op Amp
U3++	104264-G1	23207	IC, Op Amp, Low Power
U14	104273-G1	23207	IC, CMOS Time Clock Plus Memory
U15,U16	104270-G1	23207	IC, CMOS 2K-Byte RAM, Low Power
U17	104225-G7	23207	IC, CMOS Octal Latch, Tri-State
U18	104280-G1	23207	IC, Quad CMOS Op Amp/ Comparator
U19	104225-G5	23207	IC, Octal Tri-State Driver
U20	104531-G4	23207	IC, Adj Neg Regulator
U21	104531-G3	23207	IC, Adj Pos Regulator
U22	104219-G3	23207	IC, +5V Regulator
Used at U14, U15,U16	110749-G7	23207	IC Socket, 24-Pin
Y1	107546-G1	23207	Crystal, 32.768 kHz

++Used in -G2 thru -G5 versions only.

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

Digital Board (G1, G2 Versions), P/N 111210-G[ ]

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
C1-C3,C4*,C5*, C6-C14,C16-C22, C41*,C42*,C43, C44,(C45A-C45C)*, C45D,C46A,(C46B-C46D)*,C48A,(C48B-C48D)*,C49A,(C49B-C49D)*	103209-G3	23207	Cap, 0.47 uf, 20%, 50V
C25	104067-G3	23207	Cap, 56 uf, 10%, 6V
C26,C27,C50	104067-G7	23207	Cap, 33 uf, 10%, 16V
C28*,C29*, C30-C33	104021-G6	23207	Cap, 1000 pf, 2%, 100V
C34,C35	104026-G5	23207	Cap, 20 pf, 5%, 500V
C36,C37	104015-G2	23207	Cap, 220 pf, 5%, 500V
C38,C39	104022-G4	23207	Cap, 200 pf, 5%, 500V
C40	104022-G3	23207	Cap, 56 pf, 5%, 500V
C47A,(C47B-C47D)*	104087-G3	23207	Cap, .022 uf, 10%, 0.63V
CR2-CR5,CR6A, CR6B*,CR6C*, CR7A,(CR7B-CR7D)*,CR8A, (CR8B-CR8D)*, CR9A,CR9B*, CR9C*	104412-G2	23207	Diode, Hi-Speed Switching
CR10,CR11	102899	23207	Diode, Schottky Barrier
Used at JA	2-530153-2	00779	Shunt, 2 Pos
JA	87348-3	00779	Post Header, 3 Pos

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*Used in -G2 version of RMUs only.

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

Digital Board (G1, G2 Versions), P/N 111210-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
Used at J1, J2,J3	643115-1	00779	Dip Socket Strip, 15 Pos
J4	87348-4	00779	Post Header, 6 Pos
J5	745641-1	00779	Cassette Holder
Q3A,(Q3B-Q3D)*	104515	00779	Transistor, LN Audio
R1*,R2*,R3, R4,R35D	RN55C1001F	81349	Res, 1.00K, 1%, 1/10W
R5	RN55D1004F	81349	Res, 1.00 Meg, 1%, 1/10W
R7	RCRO7G106J	81349	Res, 10 Meg, 5%, 1/4W
R8-R11,R23	RCRO7G104J	81349	Res, 100K, 5%, 1/4W
R12	RN55C5112F	81349	Res, 51.1K, 1%, 1/10W
R13,R14, R16	RN55C1003F	81349	Res, 100K, 1%, 1/10W
R15	RN55C5113F	81349	Res, 511K, 1%, 1/10W
R17	RN55D2214F	81349	Res, 2.21 Meg, 1%, 1/10W
R18,R19	RCRO7G510J	81349	Res, 51 ohms, 5%, 1/4W
R20-R22,R30A, R30B*,30C*	RN55C1002F	81349	Res, 10K, 1%, 1/10W
R24*,R25*,R26 R33A,(R33B-R33D)*	104719-G10	23207	Res, Var, 200K, 10%, 1/2W
R27A*,R27B*, R27C	RN55C1302F	81349	Res, 13.0K, 1%, 1/10W

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*Used in -G2 version only.

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

Digital Board (G1, G2 Versions), P/N 111210-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
R28A,R28B*, R28C*,R29A, R29B*,R29C*	RN55C1003C	81349	Res, 100K, 0.25%, 1/10W
R30D	RN55C4021F	81349	Res, 4.02K, 1%, 1/10W
R31A,R31B*, R31C*	RN55C2002F	81349	Res, 20.0K, 1%, 1/10W
R31D*	RCR07G561J	81349	Res, 560 ohms, 5%, 1/4W
R32,(R32B-R32D)*	RCR07G107J	81349	Res, 100 Meg, 5%, 1/4W
R34A,(R34B-R34D)*	RCR07G822J	81349	Res, 8.2K, 5%, 1/4W
R36D*	104719-G6	23207	Res, Var, 1K, 10%, 1/2W
R37	104719-G5	23207	Res, Var, 10%, 1/2W
RN1	104733-G5	23207	Res Network, 1 Meg, SIP
U1	104239-G1	23207	IC, CMOS Microprocessor
U2,U3	See Program Listing 105912	23207	IC, CMOS EPROM, 4K-Byte
U4	104365	23207	IC, 10-Bit A/D Converter
U5	104217-G3	23207	IC, CMOS 8-Input Priority Encoder
U6	104225-G7	23207	IC, CMOS Octal Trans Latch, Tri-State
U7,U8,U33	104225-G6	23207	IC, CMOS Octal D Latch, Tri-State

---

*Used in -G2 version only.

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

Digital Board (G1, G2 Versions), P/N 111210-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
U9	104221-G7	23207	IC, Dual 1 of 4 Decoder
U10,U11	104271-G3	23207	IC, CMOS 1 of 8 Decoder
U12-U14	104392-G1	23207	IC, CMOS Quad 2 Input NAND Gate
U15	104392-G2	23207	IC, CMOS Dual D Flip-Flop
U16	104231-G5	23207	IC, CMOS Dual One-Shot
U17	104241-G2	23207	IC, Quad Comparator
U18,U19*, U20*	104362	23207	IC, CMOS Quad Analog Switch
U21,U32A, (U32B-U32D)*	104251-G1	23207	IC, Op Amp
U22*,U29*, U30	104264-G1	23207	IC, Op Amp, Lo Power
U23	104225-G5	23207	IC, CMOS Octal Buffer, Tri-State
U24	104389-G2	23207	IC, ACIA Comm Interface
U25	104222-G1	23207	IC, Line Driver, RS232
U26	104222-G2	23207	IC, Line Receiver, RS232
U27	104271-G5	23207	IC, Quad 2-Input NOR Gate

---

*Used in -G2 version only.

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

Digital Board (G1, G2 Versions), P/N 111210-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
U31A,(U31B-U31D)*	104236-G1	23207	IC, Dual Op Amp, Lo Power
Y1	110729-G3	23207	Crystal, 5.000 MHz
Y2	107540	23207	Crystal, 1.8432 MHz
Used at U4	110749-G4	23207	IC Socket, 18-Pin, Sealed
Used at U2 and U3	110749-G7	23207	IC Socket, 24-Pin, Sealed
Used at U24	110749-G8	23207	IC Socket, 28-Pin, Sealed
Used at U1	110749-G9	23207	IC Socket, 40-Pin, Sealed

---

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

LED Indicator Board (G1-G3 Versions), P/N 111222-G[ ]

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
C1,C2	103209-G3	23207	Cap, 0.47 uf, 20%, 50V
C3	104067-G3	23207	Cap, 56 uf, 20%, 6V
DS1*,DS4*,DS7, DS10*,DS13**	104434-G1	23207	LED (Red)
DS2*,DS5*,DS8, DS11*,DS14	104434-G2	23207	LED (Yel)
DS3*,DS6*,DS9, DS12*,DS15**, DS16	104434-G3	23207	LED (Grn)
P1	1-86945-4	00779	Flex Cable
R1*,R4*,R7, R10*,R13**	RCR07G331J	81349	Res, 330 ohms, 5%, 1/4W
R2*,R3*,R5*, R6*,R8,R9,R11*, R12*,R14**, R15**,R16	RCR07G151J	81349	Res, 150 ohms, 5%, 1/4W
U1,U2	104395-G1	23207	IC, Octal D-Type Flip-Flop

---

*Used in G2 and G3 versions only.
**Used in G1 and G2 versions only.

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

RMU Adapter Board (G1, G2 Versions), P/N 111244-G[ ]

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
C1-C4,C6, C8-C13,C21	103209-G3	23207	Cap, 0.47 uf, 20%, 50V
C14	104067-G3	23207	Cap, 56 uf, 20%, 6V
C15-C18	104022-G4	23207	Cap, 200 pf, 5%, 500V
C19,C20	104015-G2	23207	Cap, 220 pf, 5%, 500V
J3A	TSW-116-10-G-S	Samtec	Header, 16 Pos, 0.1" Cent, 0.6" High
R1	RCRO7G103J	23207	Res, 10K, 5%, 1/4W
R2,R3	RCRO7G510J	23207	Res, 51 ohms, 5%, 1/4W
R4	RCRO7G104J	23207	Res, 100K, 5%, 1/4W
R5	RCRO7G681J	23207	Res, 680 ohms, 5%, 1/4W
U2	104392-G1	23207	IC, CMOS Quad 2-Input NAND Gate
U3	See Program List 105909	23207	IC, CMOS 4K-Byte UV EPROM
U5	104390	23207	IC, CMOS Octal Transceiver
U7,U8	104271-G4	23207	IC, CMOS Dual Quad Decoder
U9	104389-G2	23207	IC, ACIA Comm Interface
U10	104225-G5	23207	IC, CMOS Octal Tri-State Buffer

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

RMU Adapter Board (G1, G2 Versions), P/N 111244-G[ ] (Cont'd)

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
U11	104222-G1	23207	IC, Line Driver
U12	104222-G2	23207	IC, Line Receiver
U13	104271-G5	23207	IC, CMOS Quad NOR Gate
U14	104392-G3	23207	IC, CMOS Quad OR Gate
U15	104392-G4	23207	IC, CMOS Octal D Latch, Tri-State
Y1	107540	23207	Crystal, 1.8432 MHz
Used at U3	104933	23207	IC Socket, 24 Pin
Used at U9	104934	23207	IC Socket, 28 Pin

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REPLACEABLE PARTS LIST

RMUs AND 626-PA-6036

626-PA-6036 Mainframe (G1, G2 Versions), P/N 111243-G[ ]

REFERENCE DESIGNATION	PART NO.	MAN. CODE NO.	DESCRIPTION
A1*	111244-G1	23207	RMU Adapter PCB Assy
A1**	111244-G2	23207	RMU Adapter PCB Assy
A2**	111236-G9	23207	Modem Board
A3**	110541	23207	Phone Jack Board
	111349-G1**	23207	Phone Cord Assy
	111347	23207	Comm Interface Cable
	110709**	23207	Phone Line Cord, 25-ft
	111343-G2	23207	Rear Input Panel, Inc. Mrk
	111645-G1*	23207	Option Cover Plate, Inc. Mrk
	106670	23207	Input Mounting Bracket (2)

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*Used only on G1 version.
**Used only on G2 version.

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SECTION VII

SCHEMATICS AND GENERAL ASSEMBLY DRAWINGS

This section of the manual contains the schematic diagrams and assembly drawings for the RMU and the 626-PA-6036 Interface Adapter, The revision levels of the schematics and drawings are indicated on their respective pages.

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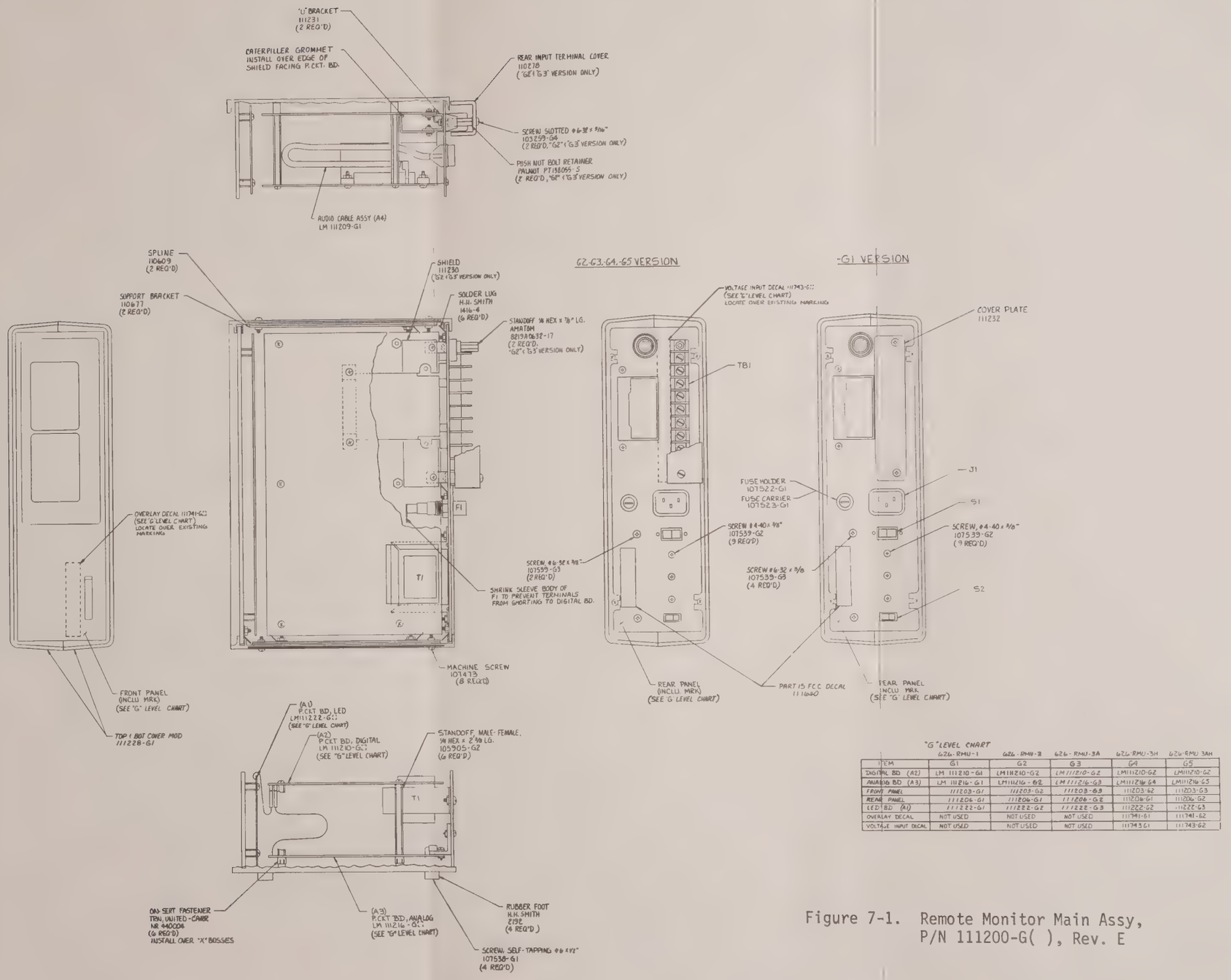

"G" LEVEL CHART

ITEM	G26-RMU-1 G1	G26-RMU-2 G2	G26-RMU-3A G3	G26-RMU-3H G4	G26-RMU-3AH G5
DIGITAL BD (A2)	LM 111210-G1	LM111210-G2	LM111210-G2	LM111210-G2	LM111210-G2
ANAROG BD (A3)	LM 111216-G1	LM111216-G2	LM111216-G3	LM111216-G4	LM111216-G5
FRONT PANEL	111203-G1	111203-G2	111203-G3	111203-G2	111203-G3
REAR PANEL	111206-G1	111206-G1	111206-G2	111206-G1	111206-G2
LED BD (A1)	111222-G1	111222-G2	111222-G3	111222-G2	111222-G3
OVERLAY DECAL	NOT USED	NOT USED	NOT USED	111741-G1	111741-G2
VOLTAGE INPUT DECAL	NOT USED	NOT USED	NOT USED	111743G1	111743-G2

Figure 7-1. Remote Monitor Main Assy, P/N 111200-G( ), Rev. E

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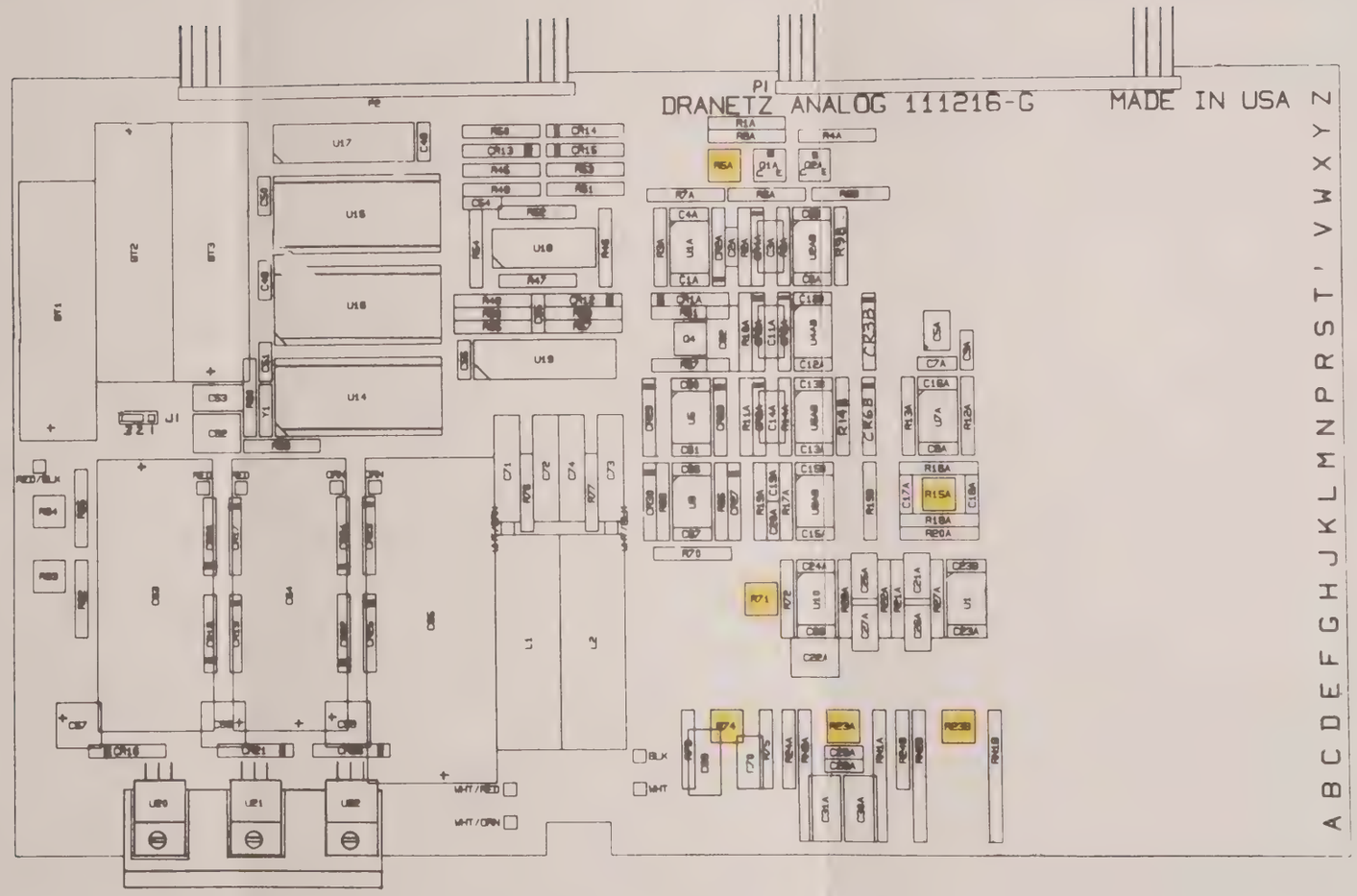

Figure 7-2. Analog Board Assy, P/N 111216-G1, Rev. E (Sheet 1 of 5)

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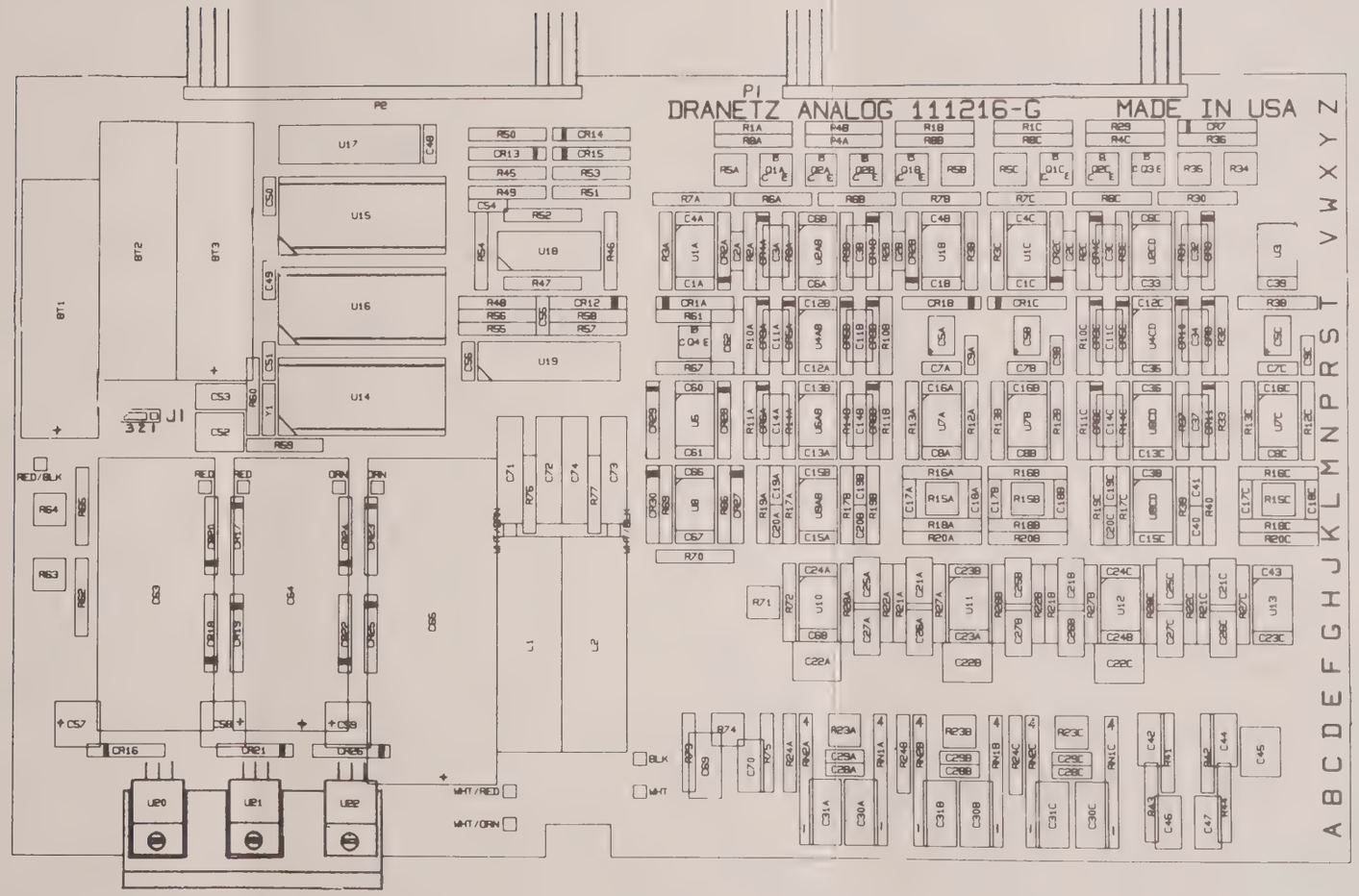

Figure 7-2. Analog Board Assy, P/N 111216-G2
Rev. E (Sheet 2 of 5)

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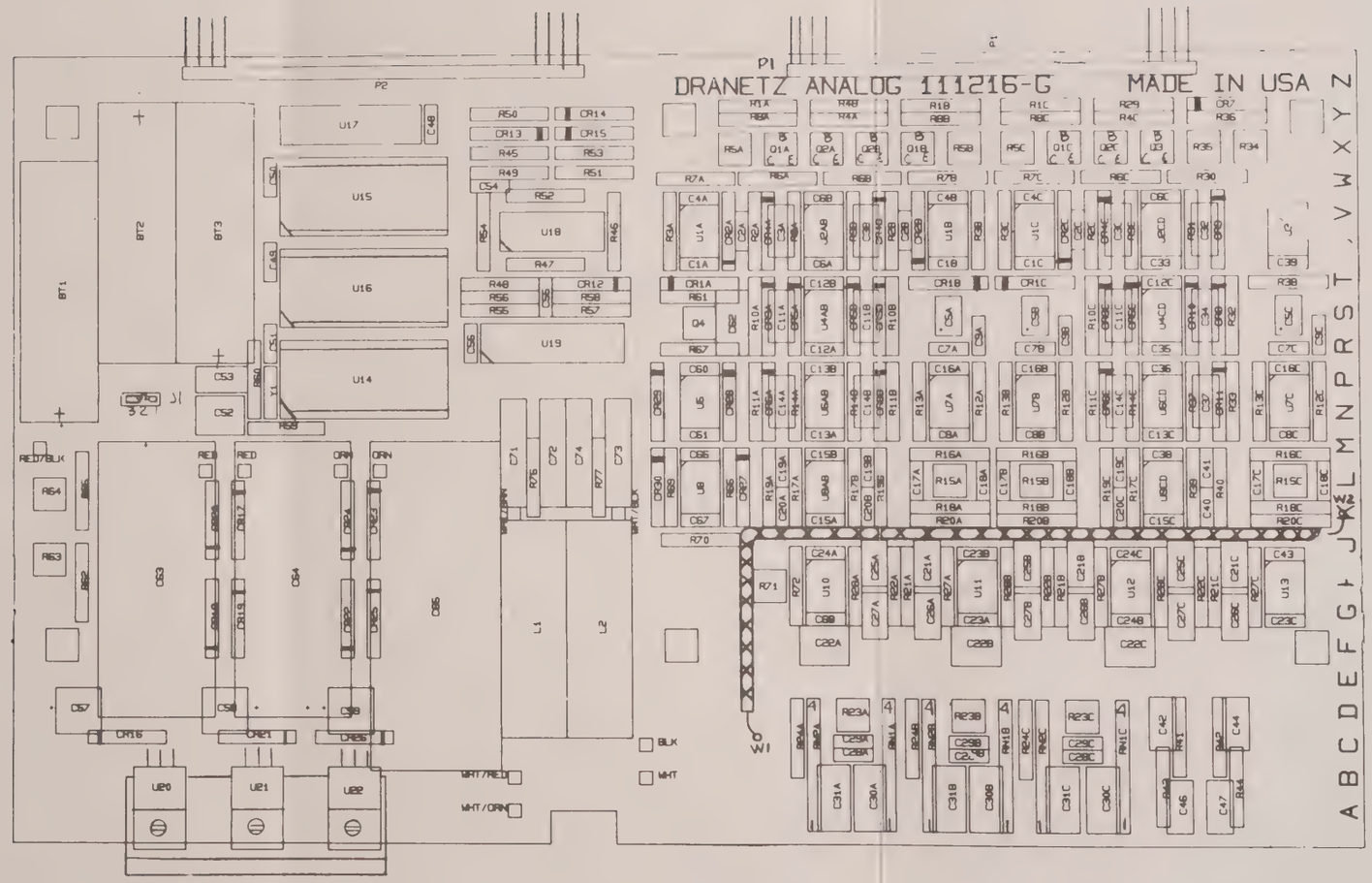

Figure 7-2. Analog Board Assy, P/N 111216-G3, Rev. E (Sheet 3 of 5)

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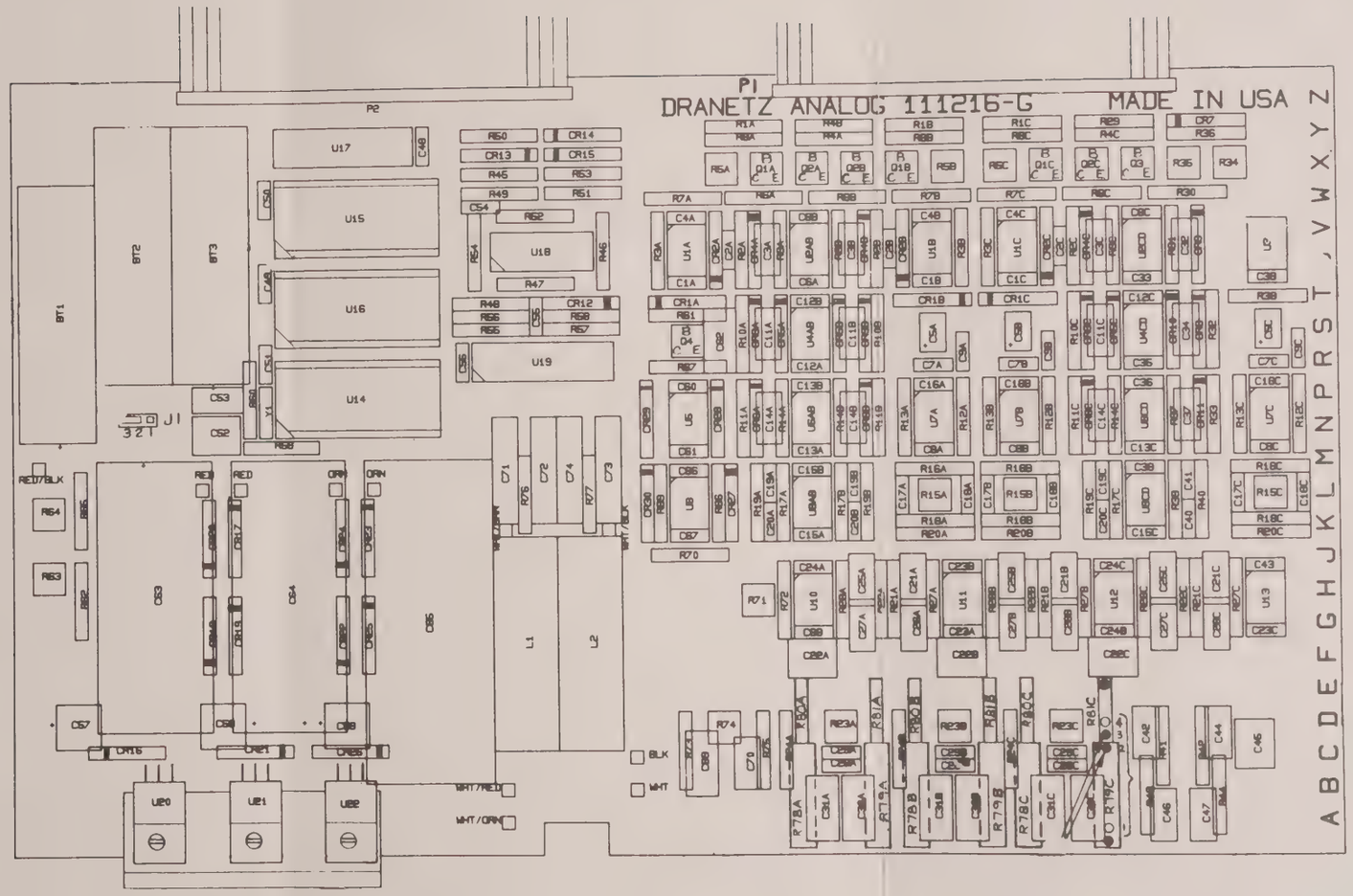

Figure 7-2. Analog Board Assy, P/N 111216-G4
Rev. E (Sheet 4 of 5)

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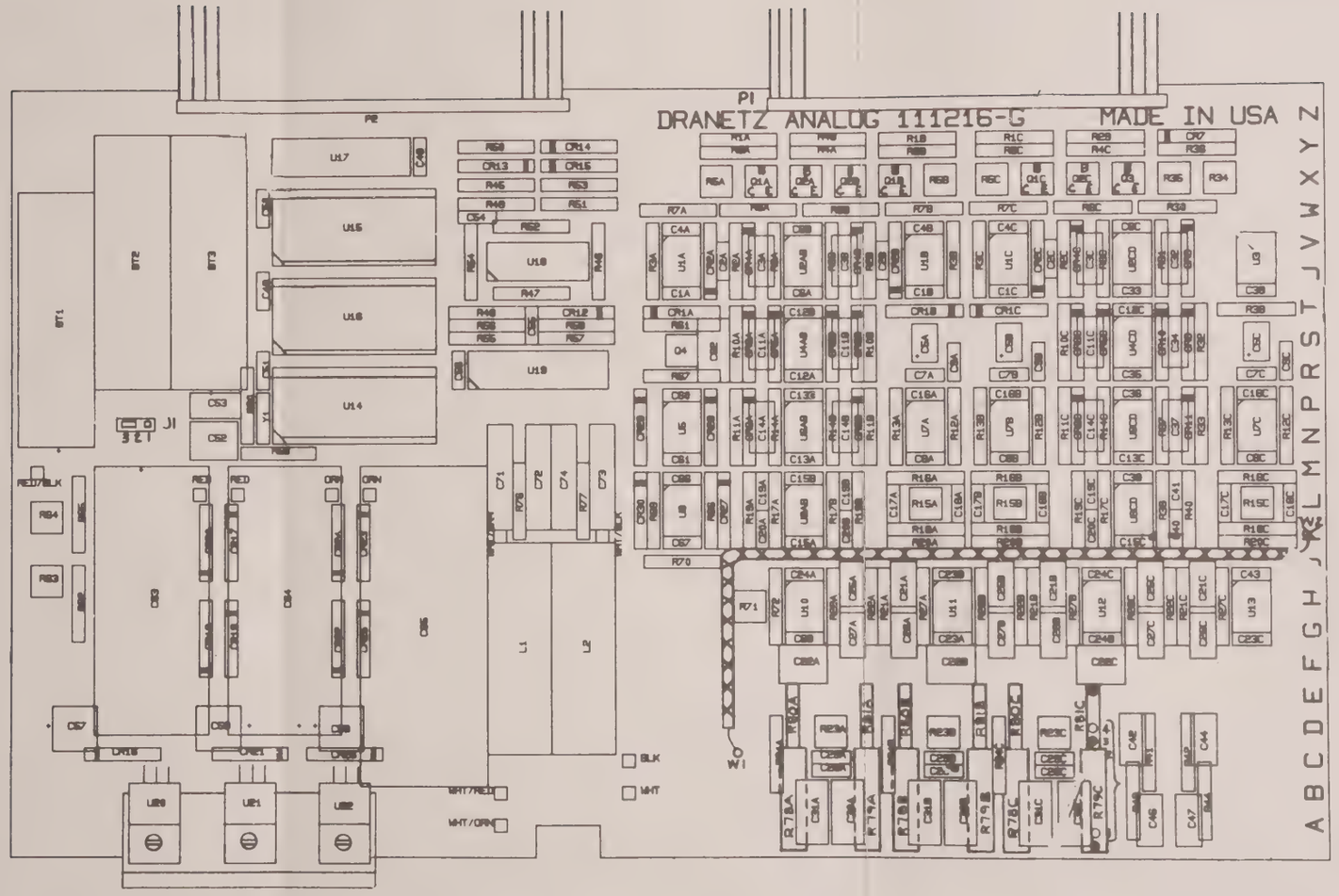

Figure 7-2. Analog Board Assy, P/N 111216-G5
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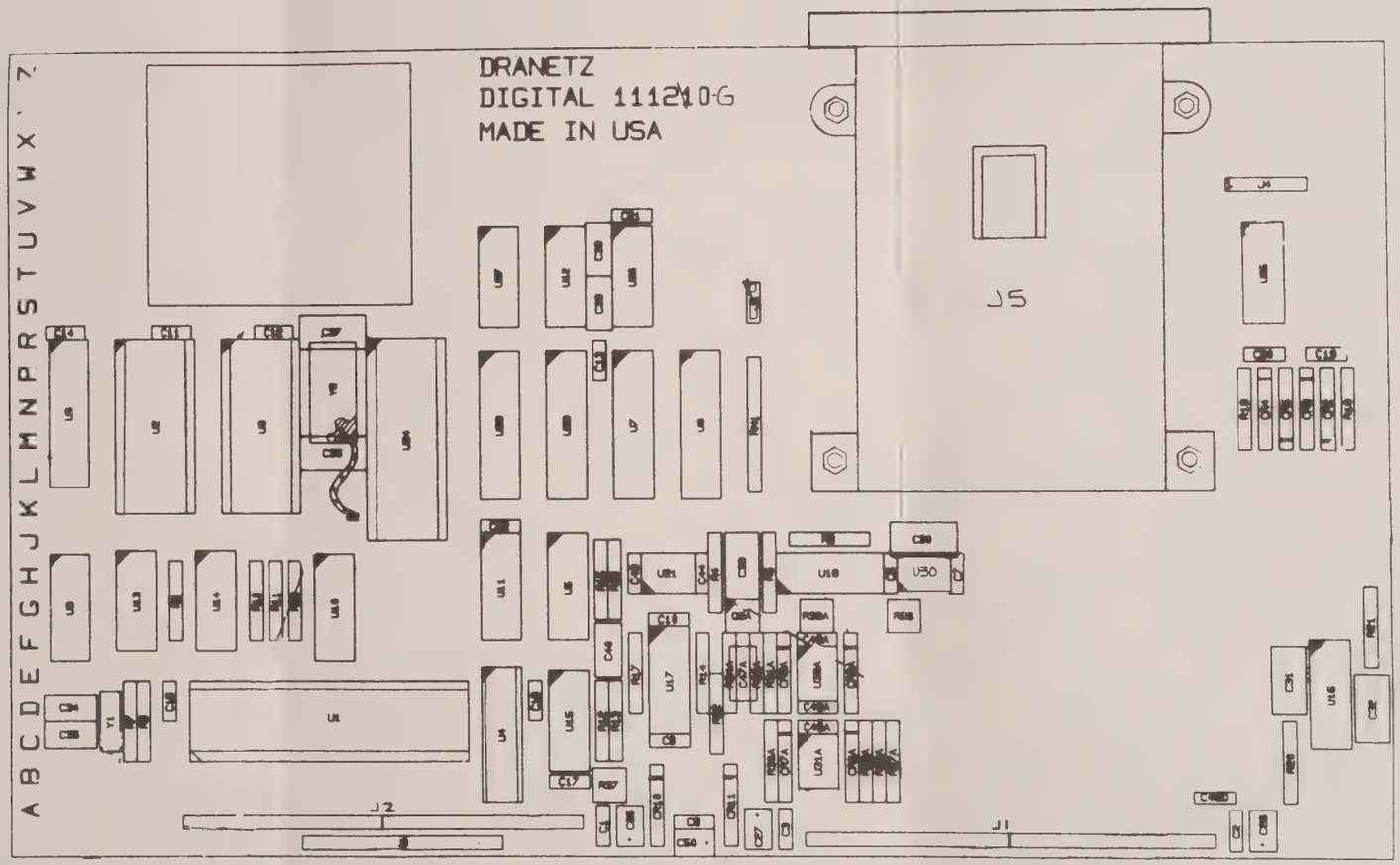

Figure 7-3. Digital Board Assy, P/N 111210-G1, Rev. D (Sheet 1 of 2)

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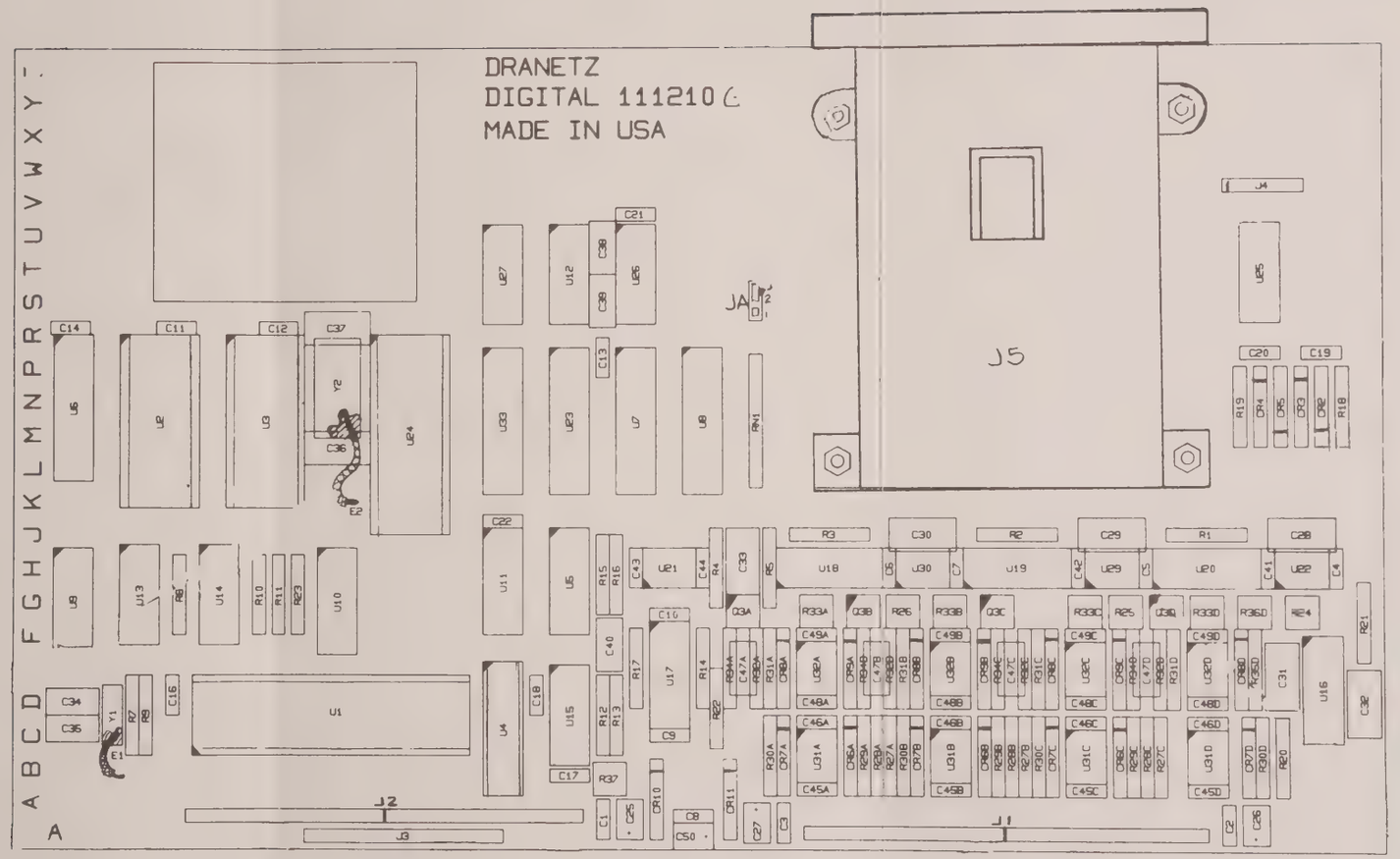

Figure 7-3. Digital Board Assy, P/N 111210-G2, Rev. D (Sheet 2 of 2)

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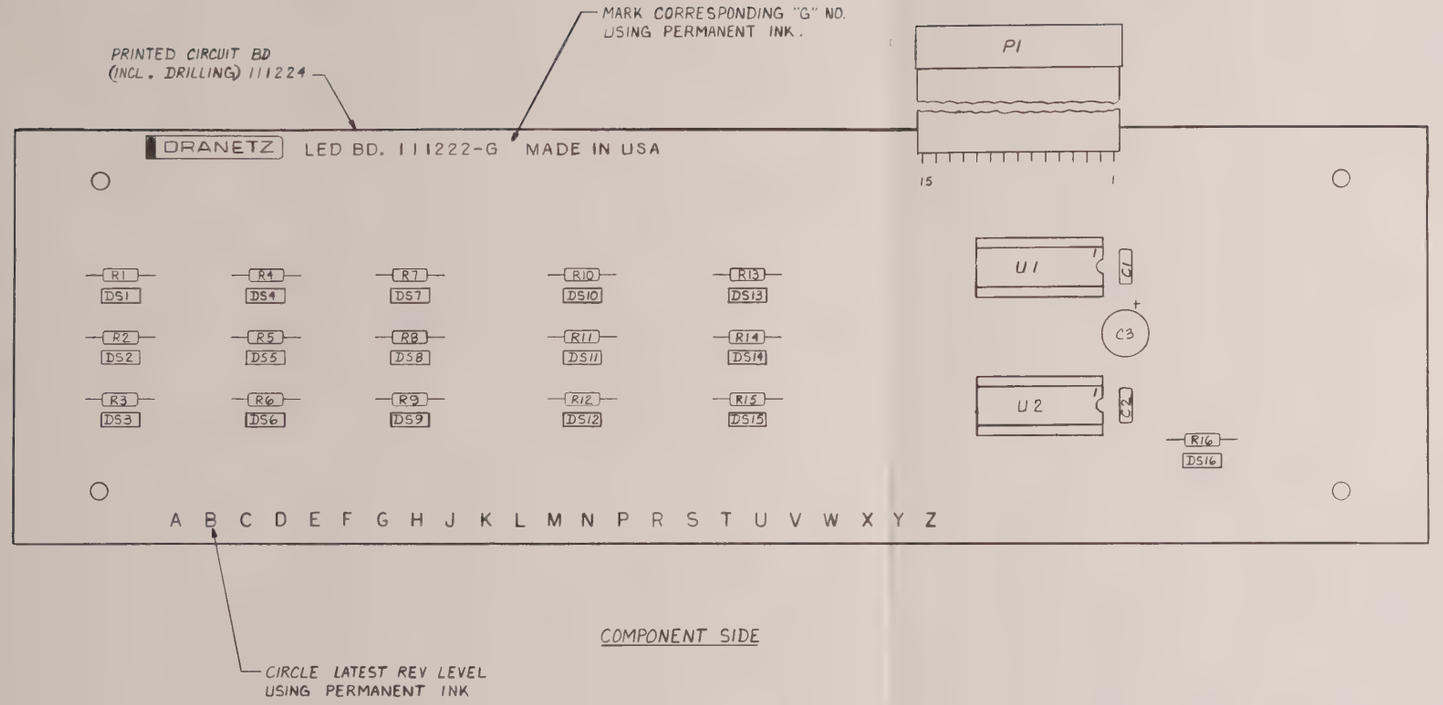

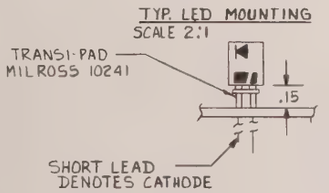

"G" LEVEL TABLE	
"G" NO.	NOT USED
-G1	DS1-6, DS10-12 R1-6, R10-R12
-G2	AS SHOWN
-G3	DS13-15 R13-15

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Fig 7-4. LED Indicator Bd Assy: 111222-G[] (rev C)

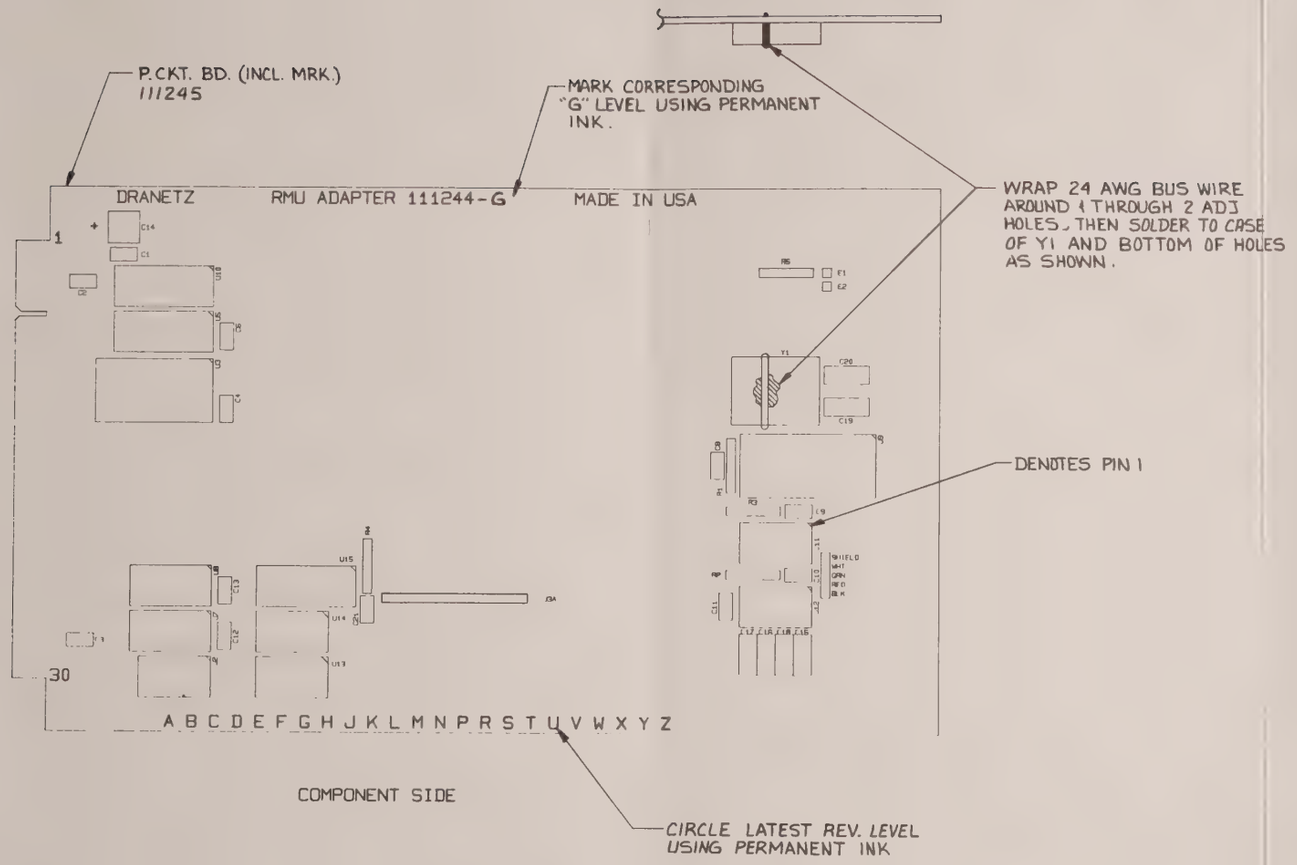
P.CKT. BD. (INCL. MRK.)
111245
MARK CORRESPONDING "G" LEVEL USING PERMANENT INK.
WRAP 24 AWG BUS WIRE AROUND & THROUGH 2 ADJ HOLES, THEN SOLDER TO CASE OF Y1 AND BOTTOM OF HOLES AS SHOWN.
DRANETZ
RMU ADAPTER 111244-G
MADE IN USA
1
30
DENOTES PIN 1
A B C D E F G H J K L M N P R S T U V W X Y Z
COMPONENT SIDE
CIRCLE LATEST REV. LEVEL USING PERMANENT INK

Fig 7-5. RMU Adapter (626-PA-6036 PC Board) Bd Assy: 111244-G[] (rev D)

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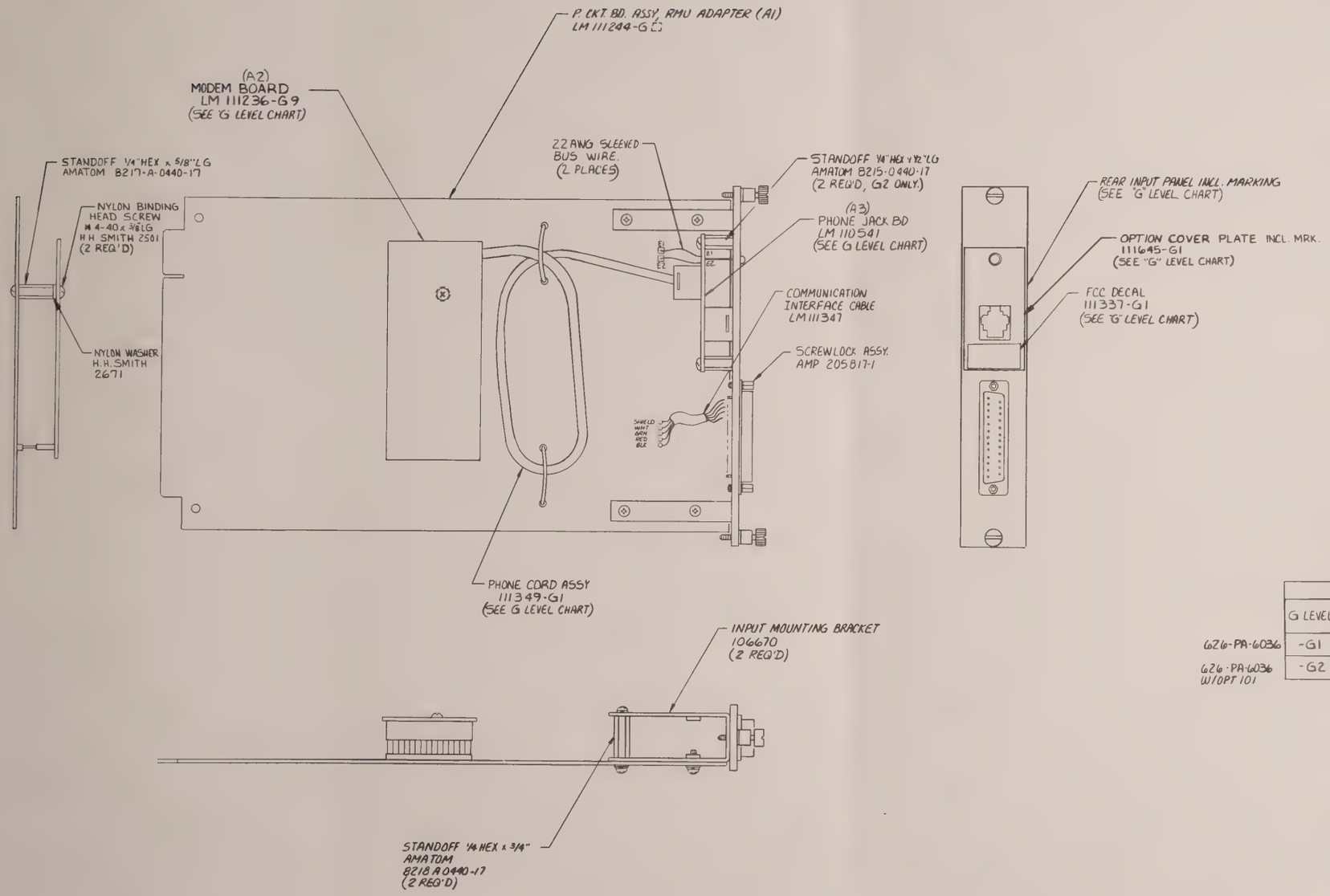

"G" LEVEL CHART

	G LEVEL	REAR PANEL INCL. MRK	PHONE CORD ASSY	PHONE JACK BOARD	MODEM BD.	FCC DECAL	OPTION COVER PLATE INCL. MRK.
626-PA-6036	-G1	111343-G2	NOT USED	NOT USED	NOT USED	NOT USED	USED
626-PA-6036 W/OPT 101	-G2	111343-G2	USED	USED	USED	USED	NOT USED

Fig 7-6. 626-PA-6036 W/Opt 101 Mainframe Assy: 111243-G[] (rev D)

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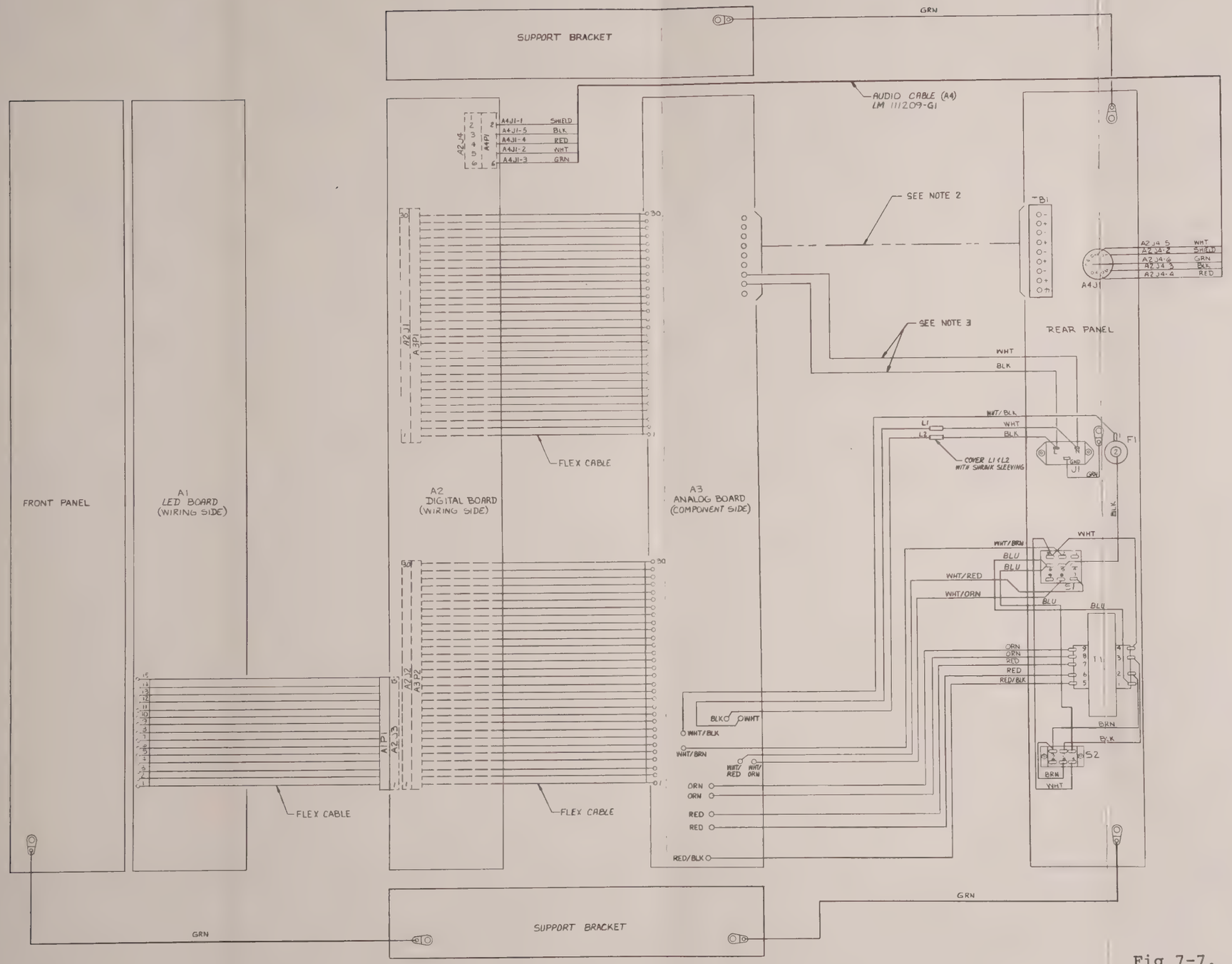

NOTES
1. UNLESS OTHERWISE SPECIFIED ALL WIRE TO BE 18AWG
2. TB1 USED ON G2, G3 VERSION ONLY
3. WHT & BLK WIRES USED ON G1 VERSION ONLY

Fig 7-7. 626-RMU Interconnecting Wiring Diagram: 111202-G[] (rev C)

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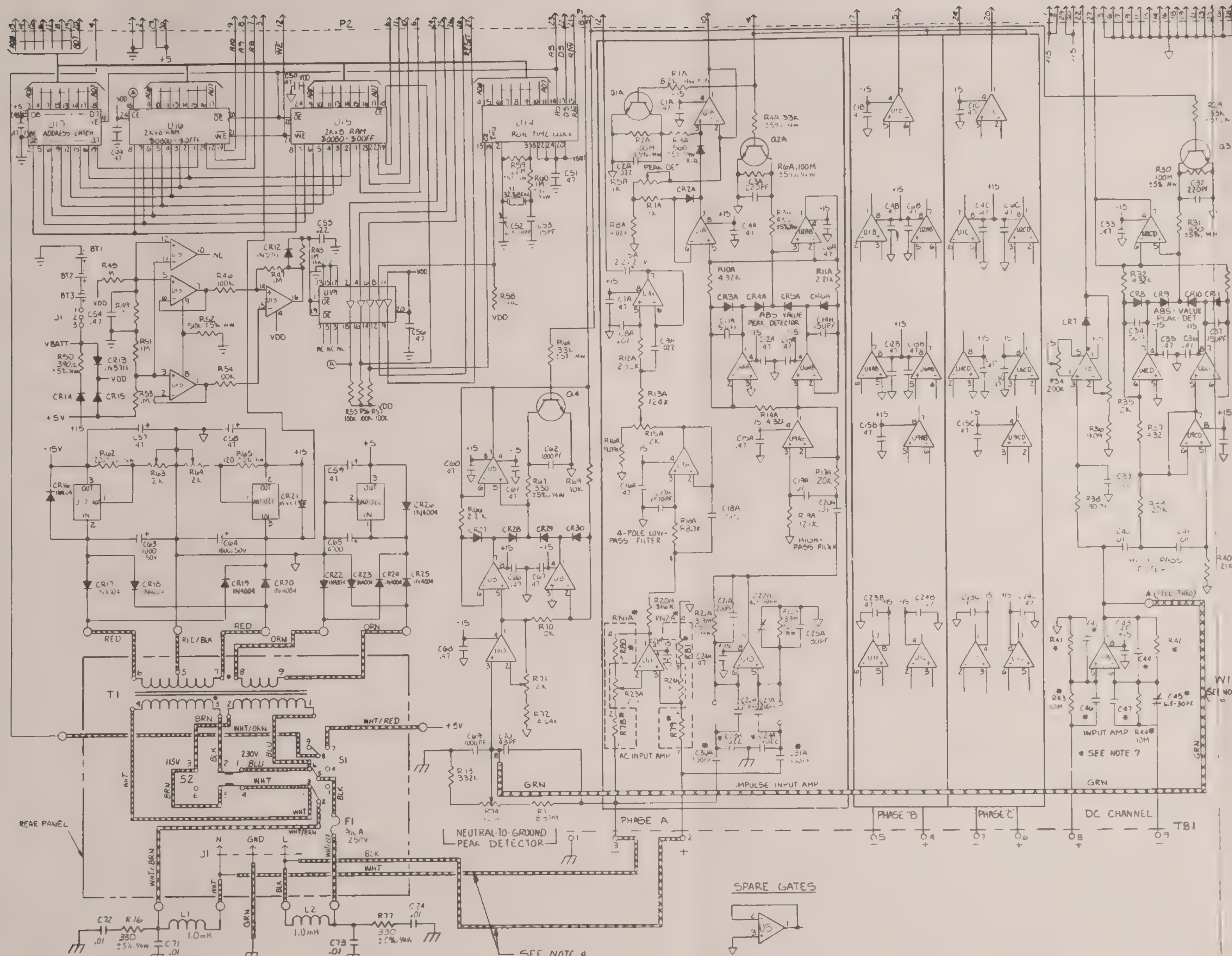

DESIG.	G1	G2	G3	G4	G5
R41	NOT USED	3.32M	432K	1.0M	432K
R42	NOT USED	3.32M	432K	1.0M	432K
C42	NOT USED	300PF	MATCHED PAIR 1000PF NOMINAL MATCH TO 1/2%	1200PF	MATCHED PAIR 1000PF NOMINAL MATCH TO 1/2%
C44	NOT USED	300PF		1200PF	
C46	NOT USED	100PF	MATCHED PAIR 43PF NOMINAL TO 1/2%	100PF	MATCHED PAIR 43PF NOMINAL MATCH TO 1/2%
C47	NOT USED	75PF		75PF	
R78A-C	NOT USED	NOT USED	NOT USED	20M	20M
R79A-C	NOT USED	NOT USED	NOT USED	20M	20M
R80A-C	NOT USED	NOT USED	NOT USED	243K	243K
R81A-C	NOT USED	NOT USED	NOT USED	243K	243K
RN1A-B	USED	USED	USED	NOT USED	NOT USED
RN1C	NOT USED	USED	USED	NOT USED	NOT USED
RN2A-B	USED	USED	USED	NOT USED	NOT USED
RN2C	NOT USED	USED	USED	NOT USED	NOT USED
C30A-C	100PF	100PF	100PF	MATCHED PAIR 50PF NOMINAL MATCH TO 1/2%	MATCHED PAIR 50PF NOMINAL MATCH TO 1/2%
C31A-C	100PF	100PF	100PF		
R43	10M	10M	10M	12.1M	10M
R44	10M	10M	10M	12.1M	10M
C45	6.5-30PF	6.5-30PF	NOT USED	6.5-30PF	NOT USED

I.C. CHART

DESIG	TYPE	+15	-15	+5	GND	VDD
U1A,B,C	TL062	8	4			
U2AB,U2CD	TL082	8	4			
U3	TL061	7	4			
U4AB,U4CD	TL082	8	4			
U5	TL082	8	[illegible]			
U6AB,U6CD	TL082	8	4			
U7A,B,C	TL062	8	4			
U8	TL082	8	4			
U9AB,U9CD	TL082	8	4			
U10	TL082	8	4			
U11	TL082	8	4			
U12	TL082	8	4			
U13	TL082	8	4			
U14	6818				12	
U15	6116LP				12	24
U16	6116LP				12	24
U17	74C373			20	10	
U18	MC14575				13	4
U19	74C244				10	20
U20	LM337T					
U21	LM317T					
U22	LM340T-5					

NOTES

UNLESS OTHERWISE SPECIFIED

1. RESISTANCE VALUES ARE IN OHMS 1/10W, ±1%
2. CAPACITANCE VALUES ARE IN MICROFARADS
3. DIODES ARE 1N4148.
4. WHT & BLK WIRES FOR G1 ONLY
5. TRANSISTORS ARE 2N2222.
6. W1 FOR G3 VERSION ONLY.
* 7. SEE 'G' LEVEL CHART FOR VALUES.
   - G1 = AS SHOWN WITH THE OMISSION OF PARTS IN PHASE B (EXCEPT FOR R6B, R9B, R14B, R19B, R23B, R24B, C6B, C12B, C13B, C15B, C23B, CR6B, CR3B, RN1B(RN2B)), PHASE C AND DC CHANNEL & W1.
   - G2 & G4 = AS SHOWN, EXCEPT WIRES USED IN NOTE 4 & W1.
   - G3 & G5 = AS SHOWN, EXCEPT WIRES USED IN NOTE 4 AND WITH THE OMISSION OF THE FOLLOWING PARTS: C69, C70, R73-R75 & C45.

Figure 7-8. Analog Board Schematic Diagram, Assy 111210-G( ), Schematic 111221-G( ), Rev. E

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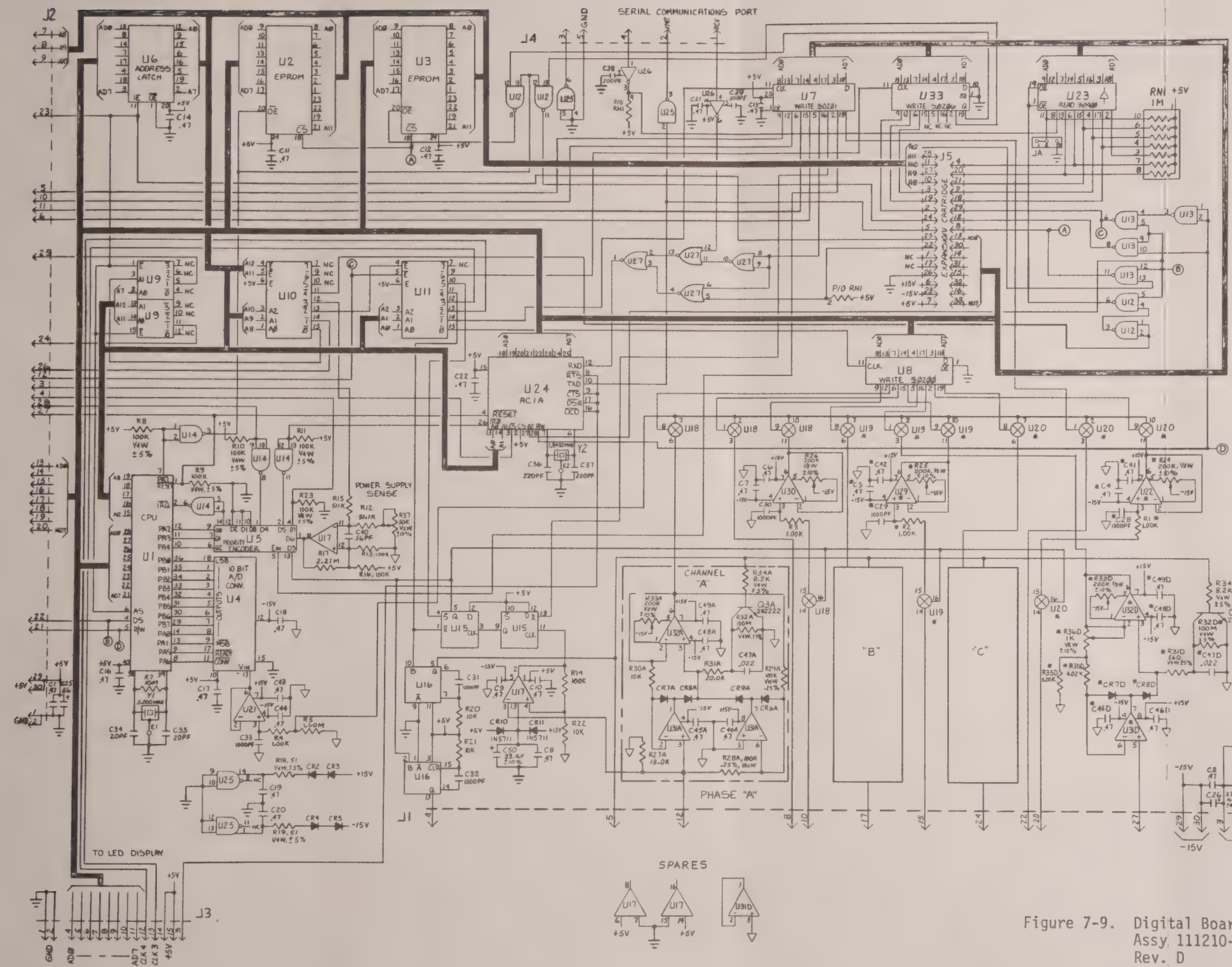

NOTES: UNLESS OTHERWISE SPECIFIED:
1. RESISTANCE VALUES ARE IN OHMS 1/10W ±1%
2. CAPACITANCE VALUES ARE IN MICROFARADS
3. ALL DIODES ARE IN4148
4. G2 VERSION = AS SHOWN
5. G1 VERSION = AS SHOWN LESS THE FOLLOWING:
   A) PARTS DENOTED BY ASTERISK (*)
   B) PARTS IN "B" & "C" CHANNELS

DESIG	TYPE	+5V	GNDD	+15V	-15V	GNDA
U1	6805E2	40	20			
U2.3	27C32	24	12			
U4	AD571	10	16		12	14
U5	4532	16	8			
U6	74C373	20	10			
U7,8,33	74C374	20	10			
U9	74LS139	16	8			
U10,11	74HC138	16	8			
U12-14	74HC00	14	7			
U15	74HC74	14	7			
U16	74C221	16	8			
U17	HA-4905	1	9		5	
U18-20	HI-201			13	4	5
U21,32A-D	TL081			7	4	
U22,29,30	TL061			7	4	
U23	74C244	20	10			
U24	R6551A	15	1			
U25	SN75188			7		
U26	SN75189	14	7			
U27	74HC02	14	7			
U31A-D	TL062			8	4	

Figure 7-9. Digital Board Schematic Diagran, Assy 111210-G( )
Assy 111210-G( ), Schematic 111215-G( ),
Rev. D

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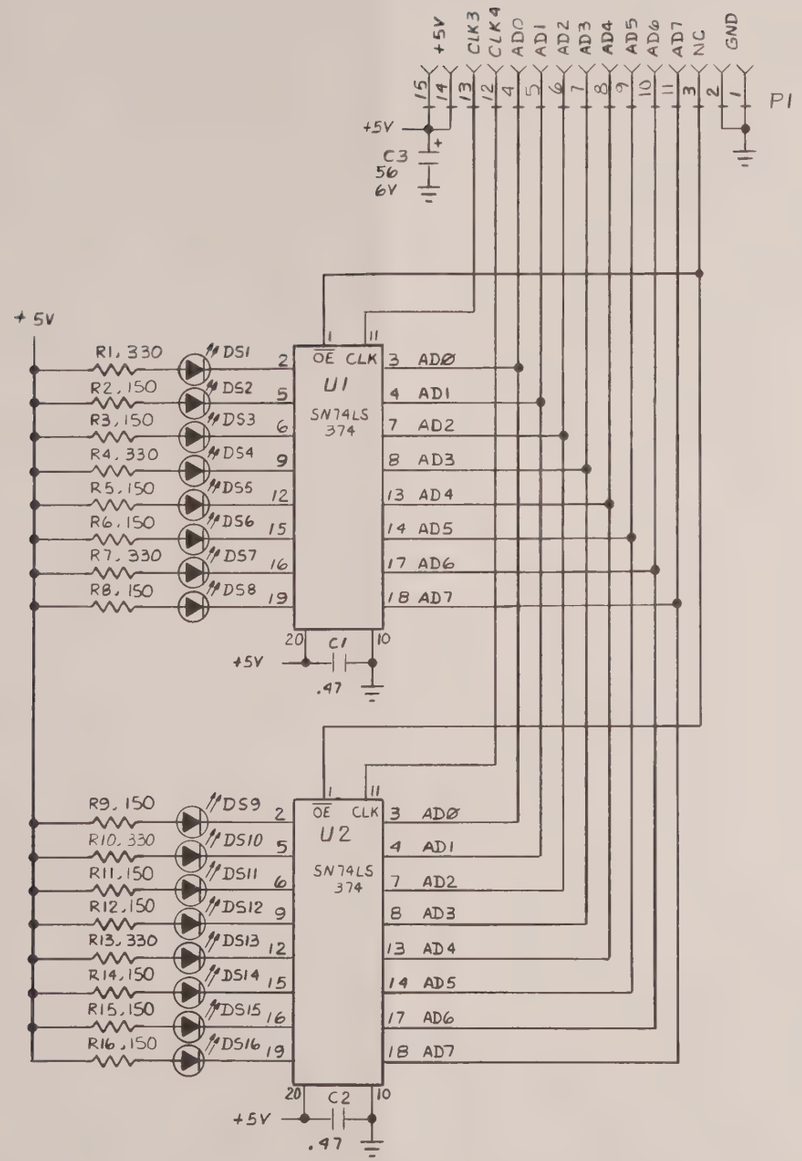

NOTES:
UNLESS OTHERWISE SPECIFIED:
1. RESISTANCE VALUES ARE IN OHMS, 1/4W, ± 5%.
2. CAPACITANCE VALUES ARE IN MICROFARADS
3. DS1, 4, 7, 10 & 13 ARE HLMP-0301 (RED)
   DS2, 5, 8, 11, & 14 ARE HLMP-0401 (YEL)
   DS3, 6, 9, 12, 15, & 16 ARE HLMP-0504 (GRN)

"G" LEVEL TABLE	
"G" NO	NOT USED
-G1	DS1-6, DS10-12 R1-6, R10-12
-G2	AS SHOWN
-G3	DS13-15 R13-15

Fig 7-10. LED Indicator Bd Schem:
Assy 111222-G[],
Schem 111227-G[] (rev C)

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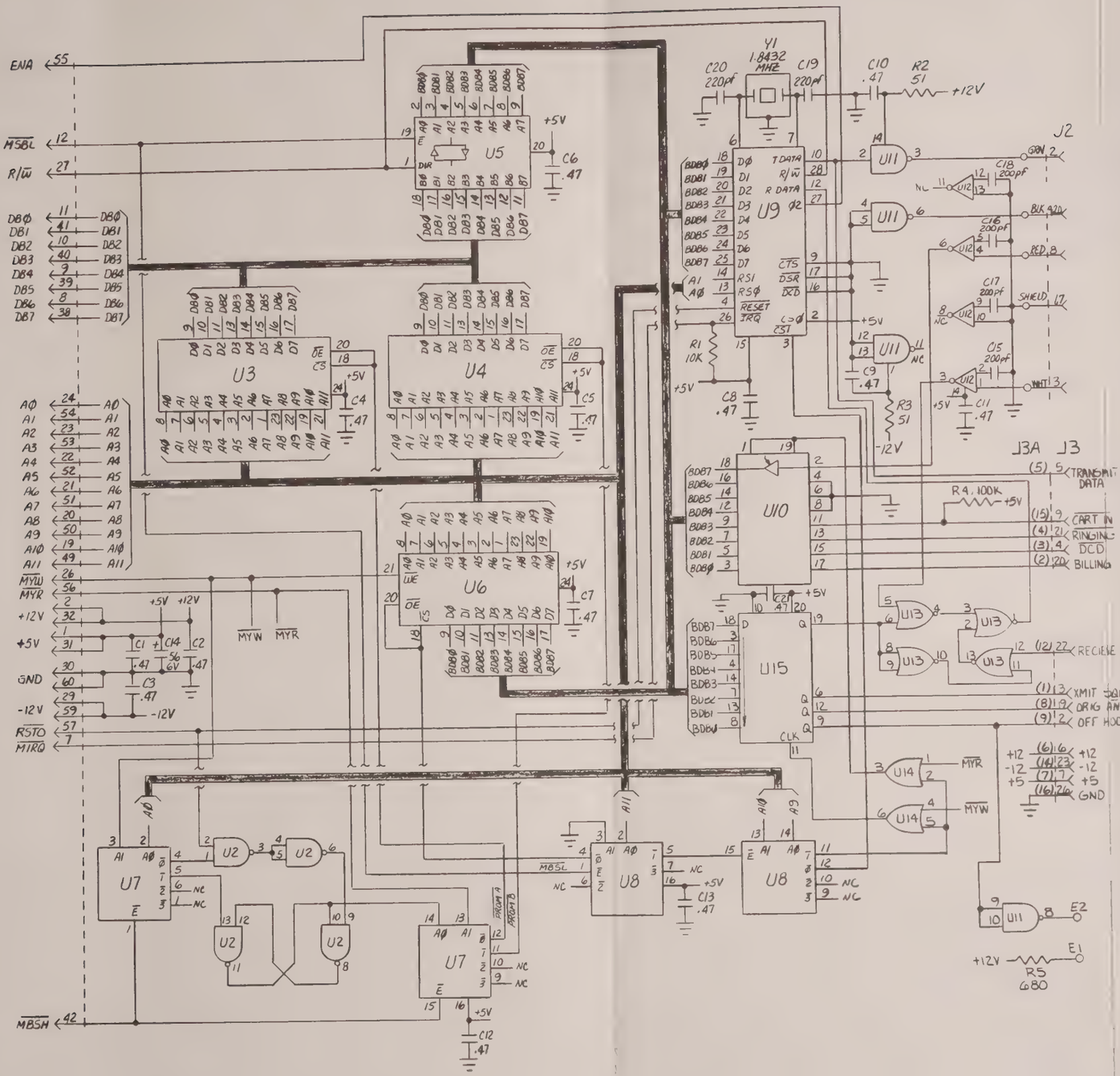

NOTES:
UNLESS OTHERWISE SPECIFIED:
1. RESISTANCE VALUES ARE IN OHMS 1/4 W ± 5%
2. CAPACITANCE VALUES ARE IN MICROFARADS.
3 U4, U6, C5, C7 & J3 ARE NOT USED FOR G1DRG2

DESIG	TYPE	+5V	GND
U2	74HC00	14	7
U3,U4	27C32	24	12
U5	74HC245	20	10
U6	HM6116LP-4	24	12
U7,U8	74HC139	16	8
U9	6551AP	15	1
U10	74C244	20	10
U11	75188	-	7
U12	75189	14	7
U13	74HC02	14	7
U14	74HC32	14	7
U15	74HC374	20	10

Fig 7-11. RMU Adapter Board (626-PA-6036 PC Bd) Schematic: Assy 111244-G[], Schem 111249-G[] (rev D)

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DRANETZ SERVICE CORPORATION
Subsidiary of Dranetz Technologies, Inc.
2385 SO. CLINTON AVE., **BLDG.1**
SOUTH PLAINFIELD, NJ 07080

TEL. (201) 755-7081
TWX: (710) 997-9553
TELEX: 499-7808
CABLE: DRANETZ

REPAIR/SERVICE ORDER

NOTE: THIS COMPLETED FORM MUST ACCOMPANY RETURNED EQUIPMENT

CUSTOMER SHIPPING & BILLING INFORMATION

CUSTOMER P.O. # _____ P.O. DATE _____

SHIP TO: _____ INVOICE TO: _____

_____ _____

_____ _____

_____ _____

In Continental U.S., material will be returned by Dranetz to you by UPS, UPS Blue or other carrier chosen by Dranetz unless otherwise designated.

EQUIPMENT BEING RETURNED

Date of Original Purchase: _____ Original P.O. # _____

Model No. _____ S/N _____

Model No. _____ S/N _____

Ancillary equipment also being returned (If you neglect this, these items may not be returned to you).

☐ Power & Other Cables _____ ☐ Instr. Book _____

☐ Plug-ins (incl. S/N) _____ ☐ Connectors _____

☐ Other _____

RETURN AUTHORIZATION

Have you discussed the problem with Dranetz Sales or Service personnel? Dranetz Return Authorization # _____

By: _____

If so, with whom _____ Date: _____

Whom should the Dranetz Service Corporation contact for technical questions?

_____ ( ) _____

NAME (Print) DEPARTMENT TELEPHONE

DESCRIPTION OF PROBLEM

Reason for return: Defective ☐ Calibration ☐

Please be detailed, explicit and complete. Include test data, if this helps to describe the problem.
IMPORTANT: Repairs cannot be made unless this section is completely filled out.
(Attach added sheets if necessary)

_____

_____

_____

_____

CHECK WHERE APPLICABLE: IS MALFUNCTION RELATED TO: Warmup ☐ Temperature ☐
Intermittency ☐ Mechanical Handling ☐ Visual Defects ☐ Grounding ☐ Test Data Attached ☐

INITIATOR OF THIS ORDER

_____

NAME/TITLE SIGNATURE TELEPHONE

(SEE OTHER SIDE FOR INSTRUCTIONS)

IMPORTANT (SEE OTHER SIDE FOR INSTRUCTIONS)

IMPORTANT (ENCLOSE THIS ENTIRE FORM WITH EQUIPMENT)

IMPORTANT: FOLLOW INSTRUCTIONS & USE THIS FORM. IT IS DESIGNED TO HELP US HELP YOU.

1. **Before** returning equipment to our factory, call our Service Corporation **Tel:** (201) 755-7081
   Give the model No., serial number, and information on the problem.

   A. Our specialists may be able to solve your problem rapidly without equipment return.

   B. If equipment return is needed, you will be supplied with appropriate instructions and authorization information to expedite service.

2. If return is to be made,

   A. Fill out the other side of this form **COMPLETELY.**

   B. Enclose original of form INSIDE the shipping carton, preferably attached by masking tape to the equipment.

   C. Ship prepaid (including insurance); we will return prepaid unless otherwise advised by you.

   D. **IMPORTANT** - PACK PROPERLY! SHIPPING DAMAGE WILL BE CHARGED TO YOU!

NOTE: NEW EQUIPMENT

Statement of Warranty - All products of Dranetz Technologies, Inc. are warranted to the original purchaser against defective material and workmanship for a period of one year from the date of delivery. Dranetz will repair or replace, at its option, all defective equipment returned, freight prepaid, during the warranty period, without charge for repair, provided there is no evidence that the equipment has been mishandled or abused.

FILL OUT OPPOSITE SIDE OF THIS FORM AND RETURN WITH EQUIPMENT.

MP MASTER
MA23106